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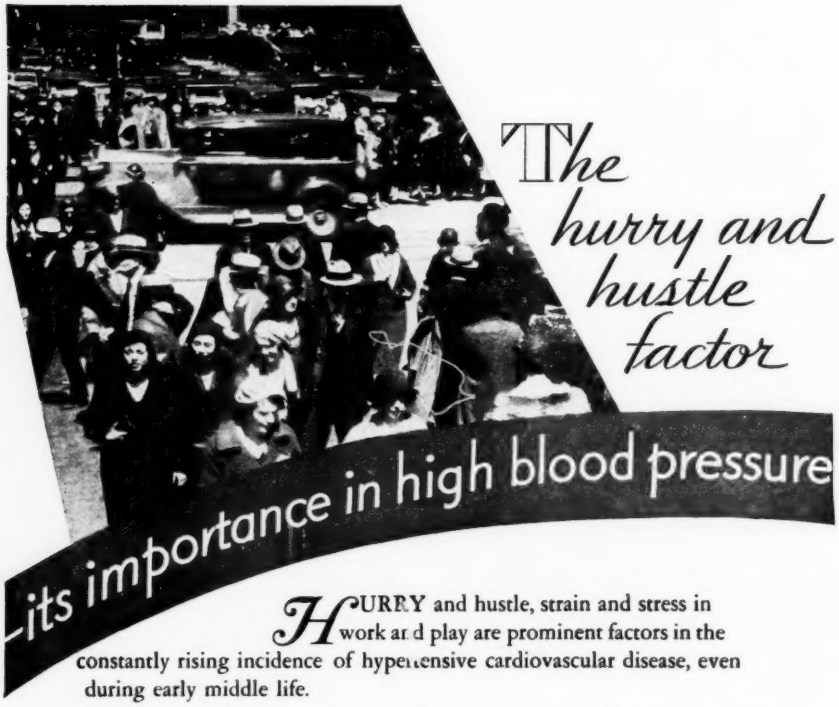

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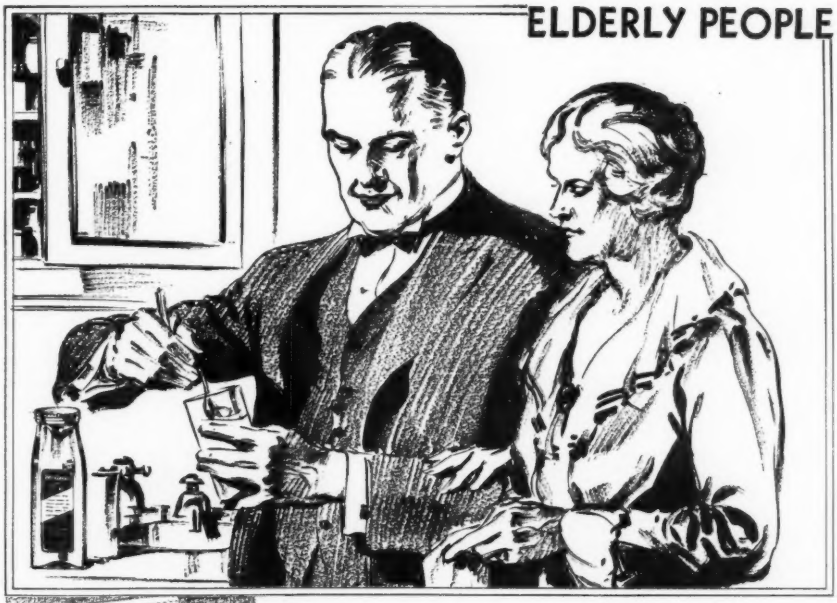

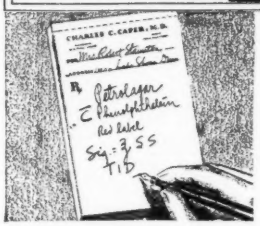

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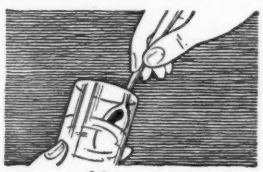

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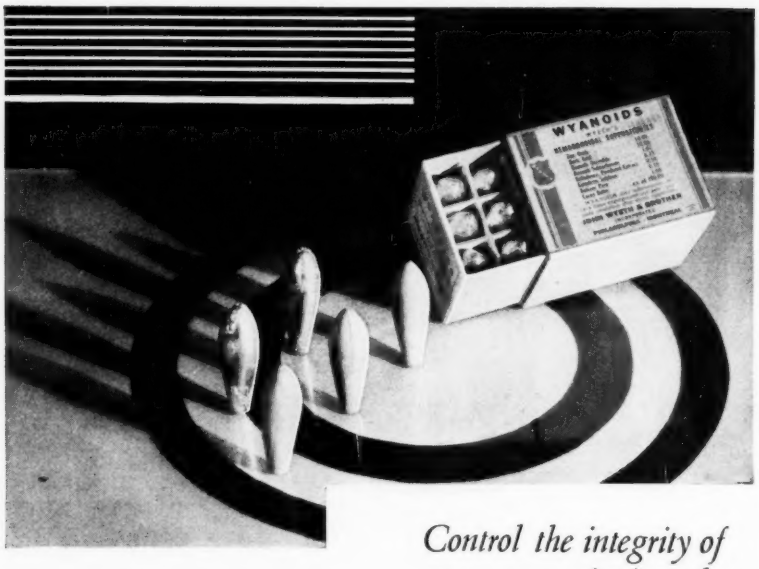

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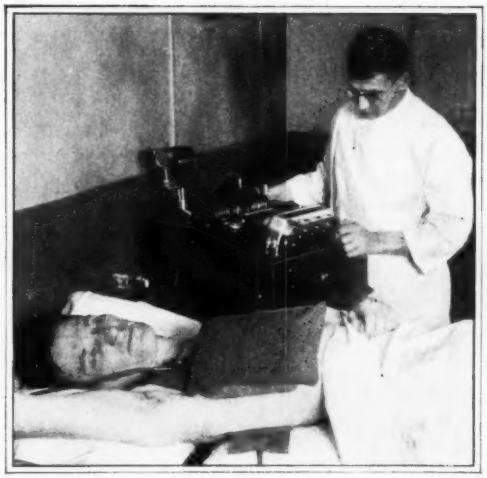

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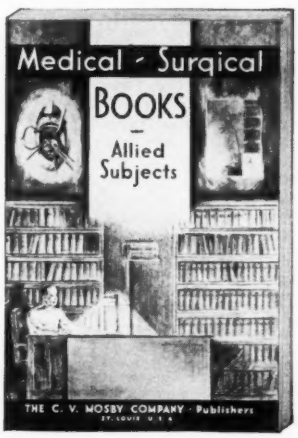

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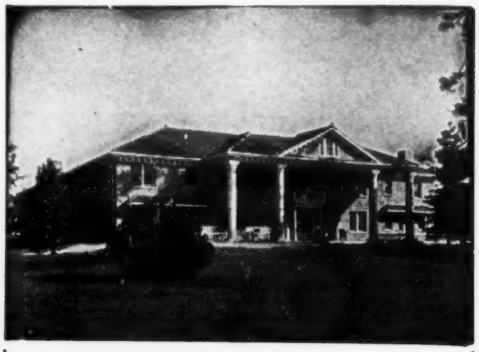

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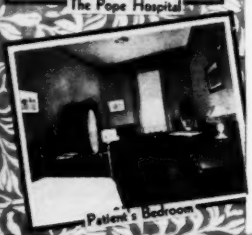
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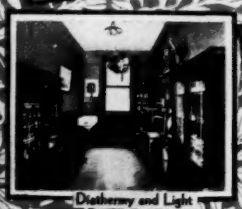
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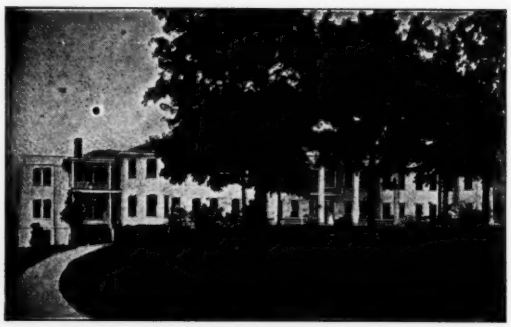

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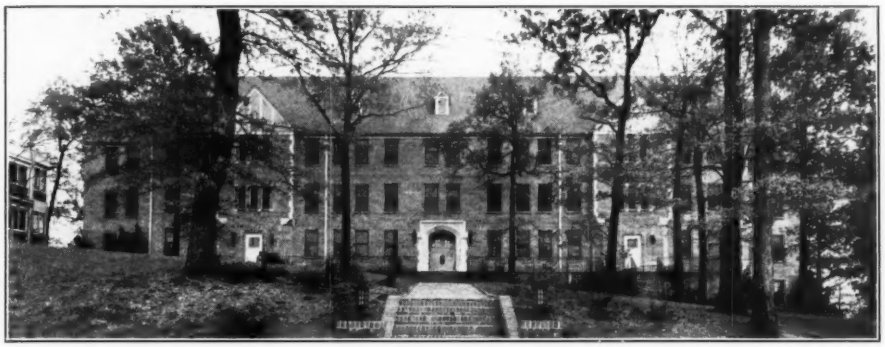

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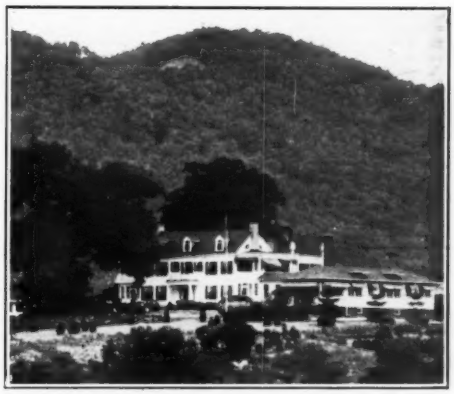

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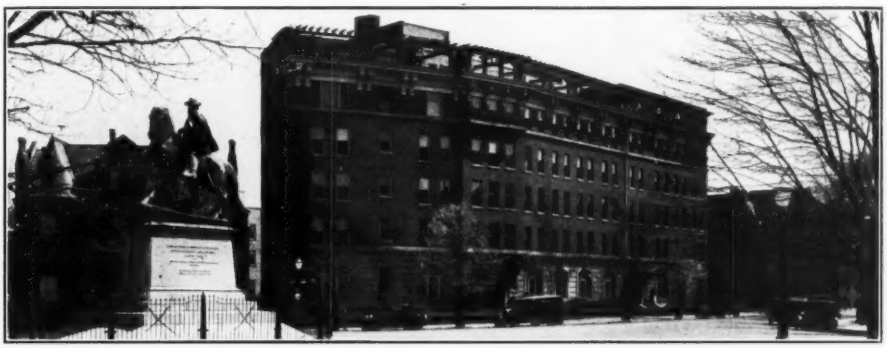

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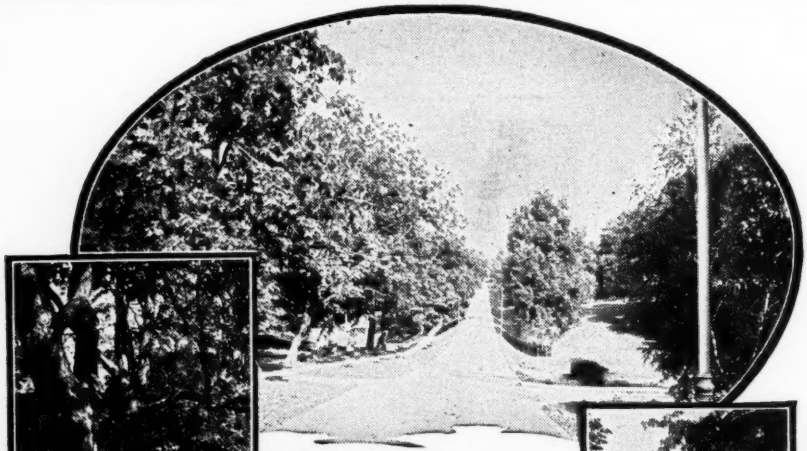

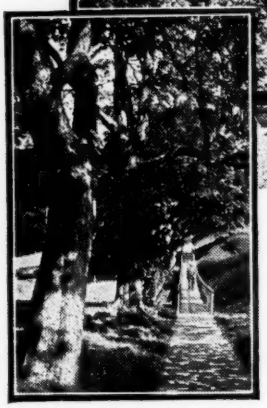

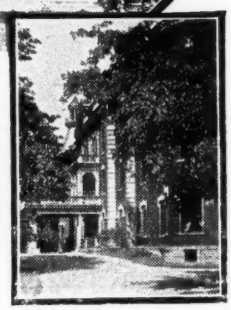

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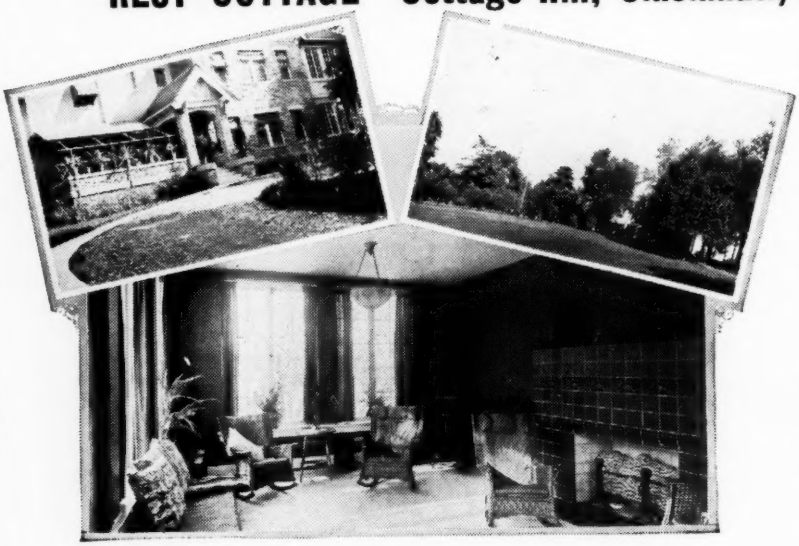

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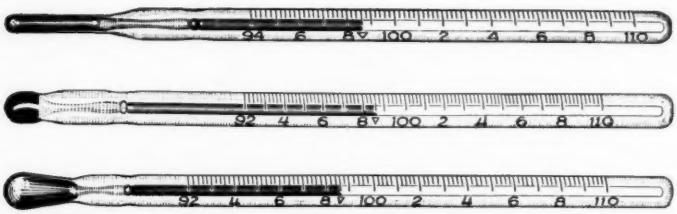

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JOURNAL OF THE SOUTHERN MEDICAL ASSOCIATION

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Volume XXVI FEBRUARY 1933 Number 2

A GENERAL CONSIDERATION OF BLOOD SUPPLY IN THE PRACTICE OF MEDICINE AND SURGERY*

By MONT R. REID, M.D.,
Cincinnati, Ohio

The honor of speaking before this Association is deeply appreciated and gratefuly acknowledged. My subject, in the final analysis, is one of paramount importance alike to all doctors of medicine. A due regard for blood supply is almost a *sine qua non* in the practice of surgery. Without the necessity of dealing with blood vessels and hemorrhage, and of giving thought to the vascular supply of tissues, surgery would be largely mechanical and uninteresting. In the practice of medicine the number of deaths due primarily to a failure of proper function of some part of the vascular system far exceeds the fatalities arising from the toxemias of infections, metabolism and new growths. Most of the so-called chronic diseases progress and ultimately kill by reason of an impoverished blood supply to vital organs. And heart disease in adult life is preponderantly a problem of nourishment, through the coronary vessels, of its own muscles.

I am not here to advance any new ideas. I want merely to draw to your attention the gradual growth and development of a subject which is usually taken for granted and, for that reason, is often too lightly considered. I want to stress some of the fundamental principles and practices with respect to blood and blood supply which should be important factors in the daily practice of medicine and surgery.

A vast change has occurred in our conception of the role of the vascular system since William Harvey's discoveries three hundred years ago. That blood is life has become a well established principle and is a far cry from the days of pitiless wastage of blood for all manner of ills, even for the treatment of the shock of hemorrhage. Our cry today is to conserve blood, to give blood, and, only on the rarest occasions, to waste it deliberately.

Notable in the progress of our knowledge since Harvey's contributions have been Marcello Malpighi, who discovered the capillary circulation; Stephen Hales, who devised a means of measuring blood pressure; Laennec, who gave us the stethoscope; Pachon, who introduced the use of an oscillometer; Halsted, Bull, Holman and others, who stressed the fact that ligatures, sutures and tension can be the cause of the death of tissues; Haldane, Benedict and Van Slyke, who have taught us and are teaching us the chemical changes that take place between the blood, lymph and body cells; Brooks and Morton and Scott, who have devised means of estimating the circulation by measuring the surface temperature; Brooks, Santos and Pireira-Caldas, who are making progress toward a visualization of the vascular system; Buerger and Allen, who have taught us that the peripheral vessels may be improved by exercise; Mackenzie and others who venture the belief that the coronary vessels and consequently the heart muscle may be helped by reasonable exercise; William Einthoven, who introduced electrocardiography; Allen, who conceived the idea of helping peripheral circulation by elevating the body temperature; Jonnesco, Royal and Hunter, Adson and Brown, Leriche and many others who have added materially to the knowledge of the role of the sympathetic nervous system and its effect upon the vascular system; Allen and White, who have demonstrated the value of sensory nerve block in the treatment of peripheral vascular diseases; the x-rays which may demonstrate calcified arteries; and a clear recognition of the damaged circulatory systems arising from thyroid disturbances, including both hyper- and hypothyroidism.

From this and much other knowledge has

*Read in General Clinical Session, Southern Medical Association, Twenty-Sixth Annual Meeting, Birmingham, Alabama, November 15-18, 1932.

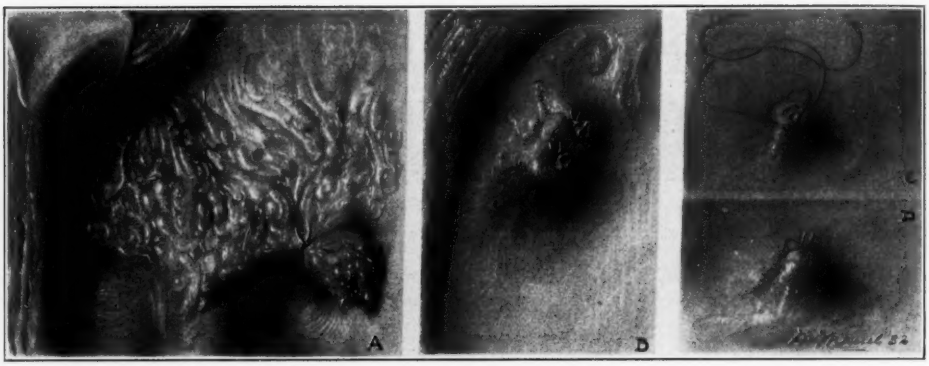

Fig. 1

A. A mass of omentum which becomes necrotic as a result of a strangulating ligature.
B. Ligation of the individual vessels produces less necrosis.
C and D. Transfixion ligature with very fine silk which will break before it can be drawn tight enough to cause much necrosis.

arisen that vista of hopes that may be fulfilled with a better understanding of the interrelation that exists between tissue metabolism, blood and blood vessels. If, as seems reasonably certain, the connective tissue of a chick can be kept alive indefinitely by removing its waste products of metabolism and by furnishing it a proper medium for growth, it is probably not too fantastic to hope that future knowledge will point the way toward the accomplishment of the same thing for human body cells.

The circulatory system is no longer the heart; it includes the farthest capillary of the body. Damage to the heart is the most spectacular, but disorders to other parts of the system are just as real and more often just as vital. Moreover, for many cardiac conditions, notably hypertrophy and dilatation unassociated with valvular disease, it seems probable that the primary cause is somewhere in the outlying portions of the vascular system.

Among the first practical demonstrations of the relationship that exists between blood supply and infection was the experimental work of W. S. Halsted upon peritonitis. It had previously been proven that it was difficult to produce peritonitis in dogs by the simple injection of even large amounts of bacteria. Along with the bacteria he injected first a small piece of potato, later small bits of macerated tissue, and was able to produce peritonitis with great regularity and with small amounts of bacteria. Similar observations were made upon the pleural cavity of dogs. Subsequently the abdominal cavity was opened and the foreign body was supplied by strangulating a bit of omentum with a ligature. The results were the same as when potato or devitalized tissue was injected along with the bacteria. From these experiments grew the great surgical principle that infections of the visceral spaces and of operative wounds in general were largely dependent upon foreign bodies and dead or devitalized tissues. In one of Bull's papers the question is raised as to why a young surgeon with beautiful aseptic technic frequently got infected wounds when the older surgeon with imperfect technic had few infections. He pointed out that the latter worked with greater confidence and decision and thus left in his wounds less traumatized and devitalized tissues. Into

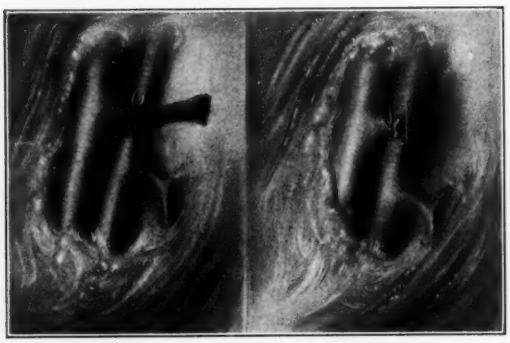

Fig. 2

Illustrating the practice of excising tissue distal to a ligature in order to lessen the amount of devitalized tissue in a wound.

every wound enter some bacteria which are eager to grow if there exists the proper medium. One of the best media is tissues deprived of their blood supply.

In the World War, experiences with the secondary closure of wounds taught us a great deal about the role that ligatures play in the causation of infected wounds. The greatest successes resulted whenever it was not necessary to bury any ligatures or sutures. Plastic surgeons have perhaps the keenest appreciation of this great principle of surgery. They will spend literally hours in controlling bleeding by means of gentle pressure and hot saline compresses, when less appreciative surgeons would hastily resort to ligatures. They know that devitalized tissues and infections are the greatest wreckers of the success of their work. The same principles are equally applicable to all forms of surgery. The dead from peritonitis sleep peacefully in their graves and we, for the most part, go on our way conscience-free. But would we, if those who died from the unnecessary strangulation of tissues by ligatures and sutures could point their fingers at us and tell us the truth of the real cause of their deaths?

With a little more detail let me enumerate some others of the present day teachings which are based upon a consideration of the role that blood supply plays in the successful practice of surgery. Whenever possible, individual vessels should be ligated and the projecting stump excised close to the ligature. When mass ligatures cannot be avoided, they should be tied so loosely that they will stop the hemorrhage but not kill the tissue. It is better to use ligatures of such strength that they will break rather than permit the complete strangulation of masses of tissue. If the oozing of blood from small vessels can be controlled by other means it is best not to use clamps and ligatures. When hemostatic clamps are applied they should be replaced very promptly by a ligature rather than allowed to remain hanging in the wound until the included bites of tissue become dry and devitalized beyond any hope of living. In many instances, vessels of any size can be seen and cut between ligatures without the necessity of applying clamps. The use of clamps upon the peritoneum, fascia and other tissues, as a simple means of traction, is well-nigh inexcusable. Nobody applies them to the skin, for we can readily see the sloughs that they cause. The tissues beneath the skin are even less resistant to their bites. No sutures should be tied tightly, for tight sutures embarrass or destroy blood supply. This warning is particularly applicable in the case of mattress sutures where entire blocks of tissue may slough. Tight skin sutures will leave the cross scars of the necrosis they produce; loose ones will not do it. Sutures in muscle tissue are rarely used for, besides doing no good, they promptly cut through the fibers and give to the wound the added burden of foreign bodies and damaged or necrosed tissues. All clean wounds are dressed with wet salt gauze, for this promotes the oozing of serum and consequently lessens the pressure that may develop within them. This pressure within wounds may be very damaging to blood supply. Wounds

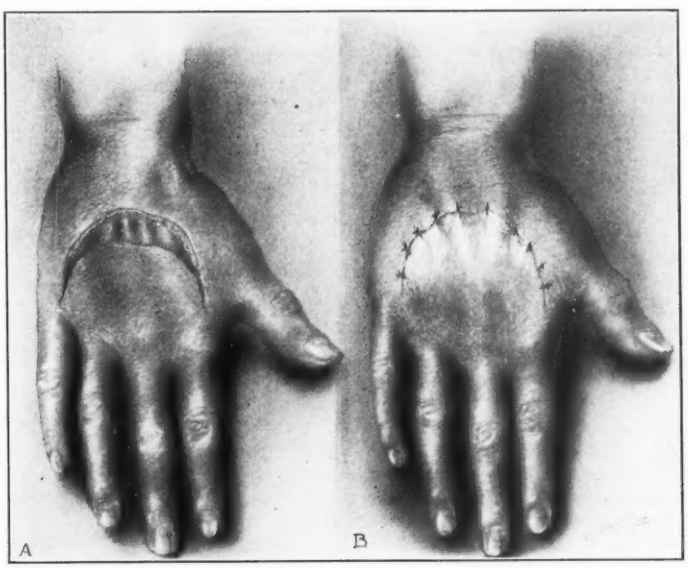

Fig. 3

A. An avulsed skin flap laid back in place unsutured but viable.
B. An avulsed flap of skin sutured and doomed to necrosis as a result of the anemia of tension. In A a very slight scar results. In B skin grafting is often necessary.

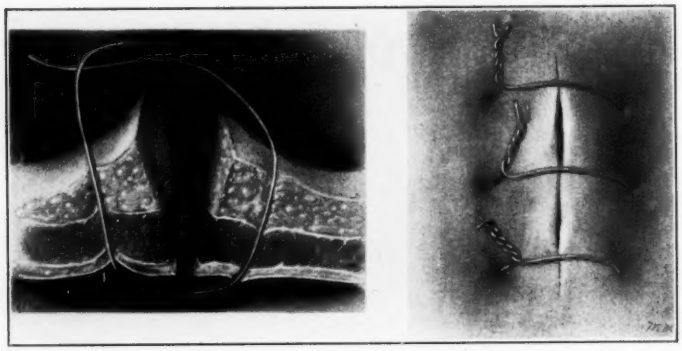

Fig. 4

Illustrating the through-and-through silver wire closure of contaminated abdominal wounds. This method avoids the foreign bodies of the sutures in the wound and also disturbs blood supply much less than the usual layer-closure.

that are kept in the position of optimum circulation will heal the fastest, and this is the basis for advice to many ambulatory patients as well as for the nursing care of bed-ridden patients. In grossly contaminated abdominal wounds, wound healing is better and infection is less if through-and-through silver wire sutures are used rather than layer sutures of the peritoneum fascia and skin. In such cases the sutures add foreign material and improperly nourished tissues to a wound that is going to suppurate. Besides, they rarely do any good. Evisceration may occur and hernias are more frequent than with the benign healing of the through-and-through silver wire closure. The value of drains is fundamentally to be explained upon the basis of exteriorizing some foreign body or dead tissue which will ultimately be discharged on the body surface and not remain in a cavity or in tissues to promote infection. Dried exudate and dry skin about the edges of an ulcer impair blood supply and consequently retard wound healing. An avulsed flap of skin is far more useful alive and unsutured than dead from the anemia of the tension of the sutures which place it beautifully back in perfect position. To tack a flap of skin loosely back one-half inch or more from the opposing edge is, I think, the hardest thing in the world for a young surgeon to do. Tight dressings may do far more damage to the blood supply of wounds than is generally appreciated. In many cases I would far rather entrust the responsibility of the closure of wounds to an assistant than to permit him to dress them. This is particularly true in the case of amputated stumps, plastic operations and grafted wounds. In the planning of every incision the source of the blood supply must be considered. For example, the concave side of all curved incisions is made toward the source of the better blood supply; incisions are never made at the outer edge of the rectus muscle when one at the inner edge will suffice. Finally, the blood supply of tissues varies with the age and condition of patients and is a factor that always deserves consideration in the judgment and practice of surgery.

I might also cite a few instances in which a consideration of blood supply is playing a role in the practice of internal medicine. Fowler's position in cases of apoplexy and head injuries

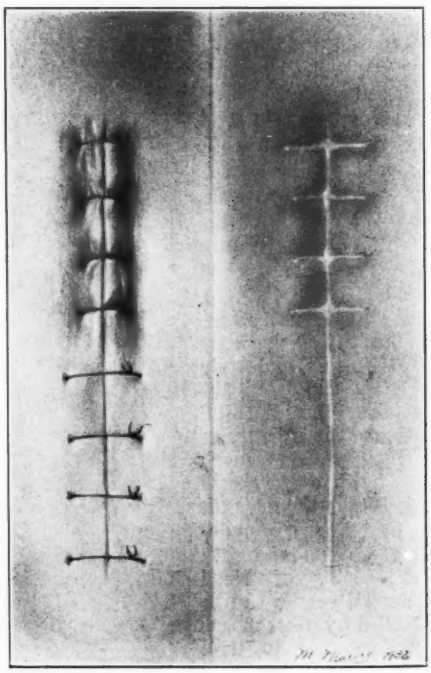

Fig. 5

Illustrating the difference between the effects of tight and loose skin sutures. The cross scars are the result of anemic necrosis.

not only tends to lessen hemorrhage and edema, but improves the circulation in the brain. A similar position in pneumonia, by reason of relieving the pressure of the abdominal viscera upon the diaphragm, improves the circulation within the lung as well as the vital capacity of the utilizable lung tissue. In cases of collapse or contusion fractures of the lung, the clinical picture of shock may often tempt nurses and doctors to elevate the foot of the bed, a practice which could easily be the determining factor in a fatal outcome. If you have ever changed such cases from the Trendelenberg to a Fowler's position, you will have witnessed the most phenomenal improvement of circulation and breathing. In general, except in cases of shock arising directly from the loss of blood, or from fainting, I believe that the Trendelenberg position has been far more detrimental than beneficial. In cases of heart disease patients have forced upon us a recognition of the fact that circulation is best in the upright position. They will not lie down flat. If such a position is good for badly damaged hearts, there is no really logical reason why it should not be good for the function of slightly diseased hearts. Listening over diseased vessels with the stethoscope often yields valuable information. Blood supply in general paresis is improved by the fevers of malaria and other means of elevating temperature.

I might continue to cite other instances in which blood supply is influencing many medical and surgical teachings, but I want to devote some time to a consideration of peripheral vascular diseases, for they present a common ground of interest for the practitioners both of medicine and surgery. They serve well to illustrate the importance of my plea for a constant consideration of blood supply in the practice of all branches of medicine.

The most frequently encountered peripheral vascular diseases are those arising from arteriosclerosis, Buerger's and Raynaud's diseases. They each have clinical syndromes and diagnostic features which make them fairly readily recognizable. But for the purposes of this discussion they need not be so sharply distinguished; they have in common a reduction in blood supply of the extremities. The problem is, how can we improve or make serviceably adequate this impaired circulation. I will emphasize the following practical points.

It is essential to have the patient's maximum cooperation. A most painstaking explanation of the problem with which he is confronted is necessary. He must understand the reason for the various things that he is told to do. He should know that a reduced circulation means impaired nourishment to tissues, and that tissues with deficient nourishment cannot heal readily nor combat infection normally and that consequently any abrasion or infection of the skin should be given extraordinarily good care; that each arterial spasm leaves some permanent damage to tissues; and that infected vessels should no more be traumatized than boils or other infections. Yet when the reasonableness of advice has been made perfectly clear and understandable the actual observance of it must be watched and checked until one is sure that one has obtained the patient's maximum interest and cooperation. General instructions will not be carried out until the details have been so frequently checked that they become a matter of routine and constant consciousness on the part of the patient. A good index of one's success along these lines is the development of ideas or the offering of suggestions on the part of the

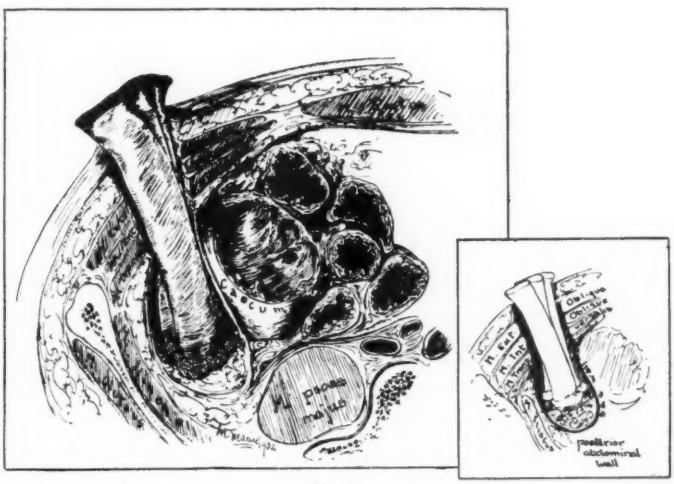

Fig. 6

Intra-abdominal drains are quickly surrounded by fibrin and adhesions. They mainly serve to exteriorize dead or devitalized tissue which would otherwise make it more difficult for the peritoneum to combat infection.

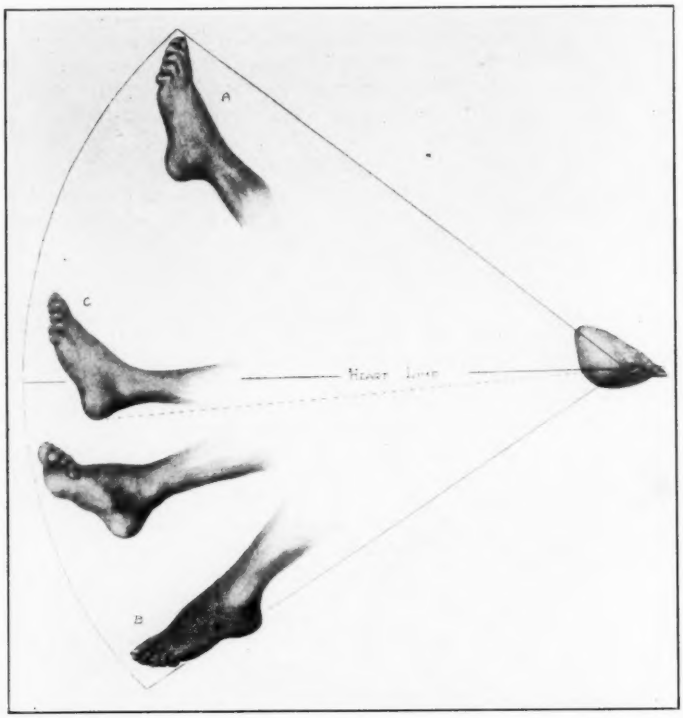

Fig. 7

Illustration of the effect of position, with respect to the heart, upon the circulation of a foot in a case of peripheral vascular disease. Too great elevation above the heart is far more detrimental to the circulation than is a similar degree of dependency. (A) The foot is pale and cadaveric; the veins are collapsed and produce grooves in the skin. (B) The foot is congested; the veins are distended and produce elevations of the skin. (C) Position of optimum circulation. The veins are neither distended nor collapsed. This level, with respect to the heart, varies with the degree of circulatory embarrassment and must be determined for each case by gradually elevating the foot from position B toward A and noting at what level the effect represented in C occurs. It is always somewhat below the level of the heart.

patient. When the patient's interest and cooperation are definitely obtained he frequently makes real contributions toward the treatment of his own condition.

The fact that the great majority of cases of peripheral vascular diseases are seen or diagnosed only after some serious complications, such as infection and gangrene, have appeared, should lead to a determined effort of the medical profession to make earlier diagnoses and, thus, to institute treatment and to enlist the patient's cooperation, which would undoubtedly reduce the incidence of complications that frequently mean the loss of extremities. If it were the rule to record the pulse from an examination of the pedal rather than the wrist pulses, many more cases of early vascular trouble would be detected.

It is important to determine the level of a resting extremity which will result in the optimum circulation. We believe this point to be at the level where the veins are neither collapsed nor distended, when they are visible and apparently on the same level with the surface of the skin. This is an observation that the patient can make and in which he usually takes a great interest. Once the level of optimum circulation has been determined and the patient made to realize its importance, he will usually endeavor to place his affected extremities at the best level whenever they are at rest. Many of my patients try to observe this position of optimum circulation whenever they are sitting or lying down, in the library, office and at the dining table; on the couch and in bed.

For some reason there is a fairly general impression that in cases of peripheral vascular disease the affected extremities should be elevated well above the level of the heart. In search of a reason for this practice I have wondered if it has not been adopted from the practice of high elevation of badly infected or edematous normal extremities. The problems are, of course, in no way similar. There can be no question that many extremities are unnecessarily sacrificed as a result of rest and elevation far above the level of optimum circulation. It is difficult for me to refrain from criticism or comment when I visit hospitals and see all cases of arteriosclerosis and Buerger's disease of the extremities lying in bed with the affected parts white and cadaveric elevated on three or four pillows

far above the level of the heart. Gangrene in many cases is certainly being hastened by this rather general practice.

The patient should understand the beneficial effects of certain exercises. A simple demonstration is to make him hang his feet over the side of a bed until they become congested and have a sensation of tingling and tightness and then let him see for himself the improvement in color and sensation which comes with the moving of his ankles and toes. With this knowledge of how to improve his circulation, the cooperative patient will always move his toes and feet whenever he experiences this sensation. He soon learns that it comes most often when he stands or sits still.

When indicated it is best to require a short period of hospitalization in order to teach patients to carry out accurately the valuable exercises of Buerger and Allen. The cycles of these exercises in which time is devoted to heat, dependency with exercise and elevation is, of course, familiar to everyone. They should be a most important part of the routine of the patient's self-help. In addition to their unquestioned value they make the patient conscious of the care and duty he owes to himself. They teach him how to improve and to get the most out of his reduced circulation.

Circulation is unquestionably better when the skin is soft and delicate. It not only reduces the dangers of infection incident to cracks and callouses, but it allows a better circulation than is possible when the skin is thickened, non-pliable and binding. Careful washing and greasing or oiling of the skin should be persisted in until it becomes as nearly like a child's skin as is possible.

The great majority of the complications of peripheral vascular disease occur during cold weather. Although this is true for both the degenerative and inflammatory processes (of the vessels) it is especially true in the angiospastic conditions. If, then, one can institute treatment or a mode of life which will, in a large measure, obviate the harmful effects of cold, the dangers that these patients constantly run may be lessened. One cannot accept the patient's assertion that his feet, for example, are warm. His subjective appreciation of warmth and cold is most untrustworthy. Many times a patient will say his feet are warm when, if he himself feels them with his hands, he will appreciate that they are icy cold. Woolen socks with or without fleece-lined shoes should be insisted upon until the feet perspire, feel uncomfortably warm subjectively and definitely warm objectively. There do not appear to be any harmful effects from over-heating. On the contrary, it is our belief that sweating of the extremities is a good thing not only to improve the delicacy of the skin and the inflammatory processes beneath it, but to help the actual nourishment of the tissues. Certainly it seems to hasten the disappearance of the board-like rigidity of the toes and fingers.

It is scarcely necessary to stress the seriousness of wounds and infections of the extremities in association with peripheral vascular disease. The patient should know that his reduced circulation and consequently reduced nourishment make such complications infinitely more serious and that the most trivial wounds and infections

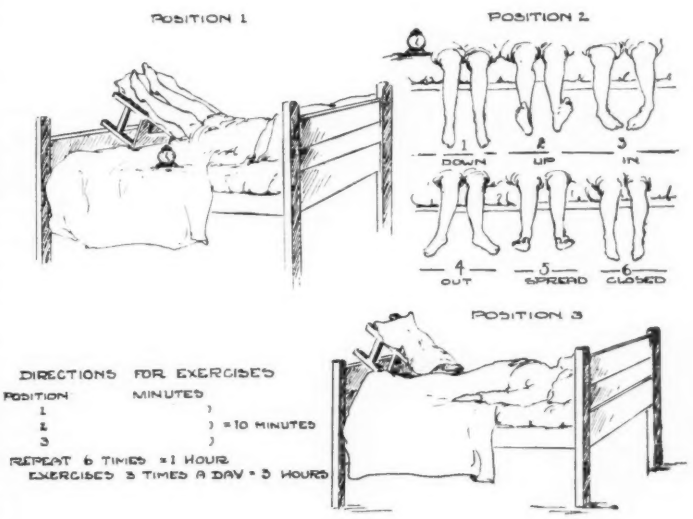

Fig. 8

Illustration of the Allen exercises. After determining the number of minutes for each position this chart is completed and given to the patient. In Position 3 the feet and legs are wrapped in hot blankets.

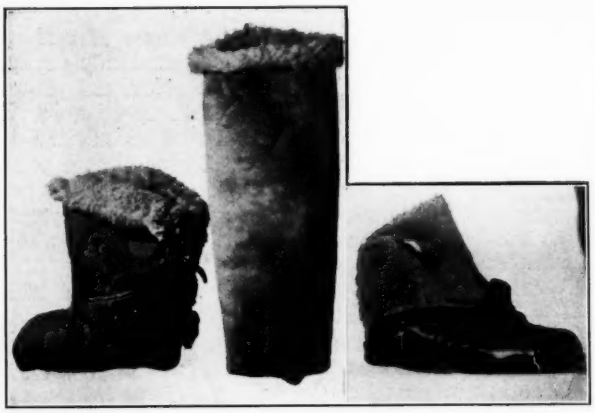

Fig. 9 (left). Sheep-skin boot and legging designed by a patient with thrombo-angiitis obliterans to keep his foot and leg warm when riding or hunting.

Fig. 10 (right). A shoe lined with wool suggested and used by a patient to keep his feet warm during the winter months.

demand the very best attention of himself and his physician until they are completely healed.

We have had a few instances which strengthen our belief in the fundamental principle that trauma, in the presence of inflammation, may do harm. In thrombo-angiitis obliterans especially, the vessels are inflamed and in the more acute cases the patients are frequently conscious of pain in the popliteal and other vessels. In one instance the taking of blood pressure in the affected leg was followed by damage to the artery and rather sudden disastrous results. In addition to the direct trauma that a tourniquet may do to diseased vessels, the temporary stasis of blood distal to it should certainly encourage the extension of a thrombotic process. The possible trauma incident to certain forms of exercise (example, horseback riding) or to passive massage should always be considered.

The fluid intake of patients with peripheral vascular disease should be very large. A simple statement to this effect is not as efficacious as to require that a daily written record be kept. Only after a patient has established a fixed routine of drinking water by actual measurement can he be trusted to take the three thousand or more cubic centimeters that should be drunk in each twenty-four-hour period. If the intake by mouth is constantly large the giving of fluids subcutaneously, intravenously or by duodenal tube becomes less necessary.

In some instances the blood pressure may be elevated and the circulation beneficially accelerated by the use of thyroid extract. Many patients with peripheral vascular disease are found to have a lowered basal metabolic rate, a relatively slow pulse and a low blood pressure. Some surgeons are using thyroid extract freely in the treatment of thrombo-angiitis obliterans. Dr. Johnson McGuire has suggested that it would probably be desirable to determine the condition of the coronary vessels by means of electrocardiographic studies before adopting this therapeutic procedure as a routine measure.

In the cases of peripheral vascular disease it would appear just as important to try to eradicate all foci of infection as it is in cases of arthritis, myositis or neuritis. This procedure would appear especially logical in the instances of thrombo-angiitis obliterans and other inflammatory conditions in which, as is usually the situation, no definite portal of entry for the infection can be found. In some cases we have tested patients for their sensitivity to vaccines made from their own organisms recovered from the sinuses, teeth and intestines, and have treated them with vaccines to which they are most sensitive. As usual, it has been difficult to evaluate this vaccine therapy.

The evidences of the harmful effects of tobacco seem now to have become definitely accepted. Experiments upon normal people show that its use lessens the peripheral circulation and lowers the surface temperature. Its use should be discontinued whenever possible.

What I have said must not be construed as minimizing the great value of employing operations upon the sympathetic nervous system or of giving foreign protein stimulation when indicated, or of utilizing the various means of estimating vascular sufficiency by a study of skin and tissue temperatures under different forms of anesthesia and foreign protein reaction and by employing oscillometers, tourniquets, and so on.

I have simply emphasized the value of the measures which often make it possible for patients to live within the limits of their reduced peripheral blood supply. There is gradually developing a greater hope for this unfortunate and, until recently, more or less hopeless group of patients. Recent studies reveal that there must be thousands of patients living and working, and unconscious of the fact that they have no pulse

in their feet. The slow, gradual occlusion may occur without the patient's being conscious of any disturbance. Our experience with this group of cases is mainly founded upon the complications which have developed from wounds and infections or from the arterial spasm resulting from a rather sudden occlusion of a diseased vessel.

In the past two years I have watched a patient through four distinct attacks of threatened gangrene. The first occurred when his right dorsalis pedis artery ceased to pulsate; the second was six months later and coincident with the disappearance of pulsation in the right posterior tibial artery; the third occurred when pulsation disappeared in the left dorsalis pedis artery and the fourth recently when the left posterior tibial artery became occluded. Each attack of threatened gangrene necessitated hospital treatment. There was intense pain, mottling and cyanosis of the foot, extravasation of some blood into the tissues and considerable loss of sensation. The slightest draft of cold air over the involved foot caused arterial spasm and intensified the pain. With most careful nursing and attention to heat, the position of the foot with respect to the heart, the fluid intake, the blood pressure, cardiac rate and the other things I have mentioned, gangrene did not occur and amputation was not necessary. Although all four pedal arteries are now occluded, it seems to me that, with good care, he should live out the rest of his life without any serious trouble in his feet or the loss of a leg. The dangers of spasm incident to the rather sudden occlusion of a large vessel are now past. Several years ago I should not have hesitated to advise amputation in any one of his four attacks of threatened gangrene. He is an old man and his vascular trouble is due to arteriosclerosis.

My remarks upon the treatment of peripheral vascular diseases are in no sense meant to be complete; they are made with the sole purpose of illustrating our changed attitude toward this difficult problem and our efforts to preserve, improve and make serviceably adequate the decreased blood supply in this group of patients.

SUMMARY

It has been my desire to bring before this Association some idea of the progress that has been made in our knowledge of the vascular system and to indicate some of the great problems which await solution. Many investigators are active in this field of research and will no doubt give us results that will have a far-reaching effect in the field of medicine.

Many of the fundamental principles in the practice of medicine and surgery are based upon a consideration of blood supply. It is often a determining factor in the problem of infection. Conscious or unconscious effort to improve it assumes a role of great importance in the therapy of disease.

In the management of peripheral vascular diseases one should secure the maximum interest and cooperation of patients. The position of maximum circulation of the affected parts when at rest should be determined for each case. The affected extremities should never be allowed to become cold. By means of baths, oils and greases the skin should be made as soft and delicate as possible. The most trivial wounds and infections should be treated as major complications until they are completely healed. Any form of trauma to the diseased vessels should be avoided. Patients should be taught the vascular exercises. The fluid intake should be established and maintained at a high level. In some cases the administration of thyroid extract may greatly improve the circulation. All foci of infection should be eliminated. Tobacco should not be used. And finally, the routine examination of all peripheral pulses would result in earlier diagnoses of peripheral vascular diseases and would make possible the avoidance of many complications which are frequently the direct cause of amputations.

A constant regard for and endeavor to improve blood supply will enhance the results not only of surgeons but of all physicians.

OUT-PATIENT DISPENSARY
CINCINNATI GENERAL HOSPITAL

Vascular Disease Clinic

GENERAL DIRECTIONS FOR THE CARE OF THE FEET

1. Wash feet each night with neutral (face) soap and water.
2. Dry feet with a clean soft rag *without* rubbing the skin.
3. Apply rubbing alcohol (70%) and allow the feet to dry thoroughly, then apply a liberal amount of vaseline or toilet lanolin and gently massage the skin of the feet.
4. Always keep your feet WARM. Use woolen socks in the winter and white cotton socks in warm weather. Use a clean pair of socks each day.
5. Use loose fitting bed-socks instead of hot-water bottles, electric heaters or any other form of mechanical heating devices.
6. Wear properly fitting shoes and be particularly careful that they are not too tight. Use shoes made of soft leather and without box toes.
7. Cut your toe-nails only in very good light and only after your feet have been cleansed thoroughly. Cut the toe-nails straight across.
8. Do not cut your corns or callouses.
9. Do not wear circular garters.
10. Do not sit with your legs crossed.
11. Do not use strong antiseptic drugs on your feet. Particularly never use Tincture of Iodine, Lysol, Cresol or Carbolic Acid.
12. Go to your DOCTOR at the first sign of a blister, infection of the toes, in-growing toe-nail or trouble with bunions, corns or callouses.
13. Drink at least four quarts of water each day.
14. Eat plenty of green vegetables and fruit in an otherwise well-balanced, liberal diet, UNLESS you have been ordered to follow some SPECIAL DIET.
15. Do not use tobacco in any form.
16. Have some member of your family examine your feet at least once each week.
17. Carry out the exercises prescribed by your Doctor exactly as you were taught to do them in the clinic. Do them regularly and faithfully.

Name..... M. D.

Date.....

Fig. 11

A list of some of the general directions given to patients with peripheral vascular disease.

CLOSED INTRAPLEURAL PNEUMOLYSIS AS AN ADJUNCT TO ARTIFICIAL PNEUMOTHORAX THERAPY OF PULMONARY TUBERCULOSIS*

By JULIAN A. MOORE, M.D.,
Asheville, N. C.

The most valuable single method of collapse therapy of pulmonary tuberculosis is artificial pneumothorax introduced by Forlanini in 1894. Unquestionably it has vastly improved the results of the treatment of pulmonary tuberculosis as attested by the experience of many men.

Unfortunately there are many patients in whom it is not successful. Matson[1] claims that in 20 per cent of patients on whom artificial pneumothorax is attempted it cannot be induced because there is no free pleural space; in 40 per cent a satisfactory collapse cannot be obtained on account of intrapleural adhesions; while in the remaining 40 per cent a satisfactory collapse can be obtained.

A complete collapse is not always essential for success, as it is well known that occasionally a brilliant success follows a partial pneumothorax. However, as a general rule, the success of pneumothorax depends upon the degree of pulmonary collapse obtained. It is true that adhesions occur most frequently over the diseased areas in the lung. Too often they prevent collapse of the very part of the lung it is essential to collapse. Frequently, these areas contain cavities, the closure of which is essential to recovery.

In 1927, Rist[2] reported the results of 759 cases of chronic unilateral tuberculosis treated by artificial pneumothorax from 1912 to 1926. Three hundred eighty-seven cases, or 52 per cent, were successful, and 372 cases, or 48 per cent, were unsuccessful. In 1929, Matson[3] reported the results of 850 cases of tuberculosis treated by artificial pneumothorax from 1911 to 1925 as follows:

Character of Pneumothorax	Clinically Well Per Ct.	Arrested Per Ct.	Dead Per Ct.
Satisfactory collapse. Adhesions preventing closure of cavities or adequate rest of the lung	48	20	21
Partial collapse. Adhesions preventing satisfactory closure of cavities or adequate rest of the lung	13	13	50

The experience of these workers corresponds to that of many others. These statistics clearly show that unless artificial pneumothorax produces a closure of tuberculous cavities and adequate rest of the lung, we cannot expect much in the way of ultimate results. It is obvious, then, that something else must be done either to improve the artificial pneumothorax or to abandon it and use some other means of collapse therapy. Probably the greatest criticism that can be directed against phthisiotherapists today is that they are prone to continue an unsatisfactory pneumothorax indefinitely when they should give the patient the benefits of surgery.

There are four ways of improving an artificial pneumothorax.

(1) By pushing the pneumothorax to high positive pressures in order to stretch adhesions. This method is seldom successful and increases the danger of perforation of the lung with its disastrous sequelae.

(2) By supplementing artificial pneumothorax with phrenic neurectomy. In a considerable number of cases, adhesions that prevent satisfactory collapse of the lung are relaxed sufficiently by paralysis of the diaphragm to permit success by continuing pneumothorax. My results from phrenic neurectomy done as a supplement to artificial pneumothorax at the North Carolina State Sanatorium have been very gratifying.

(3) By intrapleural pneumolysis by the open method. This operation has only a few adherents. I have had no personal experience with it, but it is considered by many surgeons to be more dangerous than thoracoplasty.

(4) By closed intrapleural pneumolysis, which is the particular method I wish to discuss.

In 1910, Jacobaeus[4] invented the thoracoscope. In 1913[4] he attempted and succeeded in dividing pleural adhesions in a pneumothorax cavity. His original thoracoscope was rather imperfect and the operation at first did not gain much favor. He has since improved it, and several men have devised thoracoscopes, including Unverricht, who has made the best instrument for this purpose.

The Unverricht thoracoscope consists of a long cylinder 15 mm. in diameter and contains a lens system that gives a right angled field of vision. It carries a light at the tip of the instrument. It is introduced through a cannula previously inserted between the ribs. The cautery is inserted through a separate cannula and is manipulated while under view through the thoracoscope.

*Read in Section on Surgery, Southern Medical Association, Twenty-Sixth Annual Meeting, Birmingham, Alabama, November 15-18, 1932.

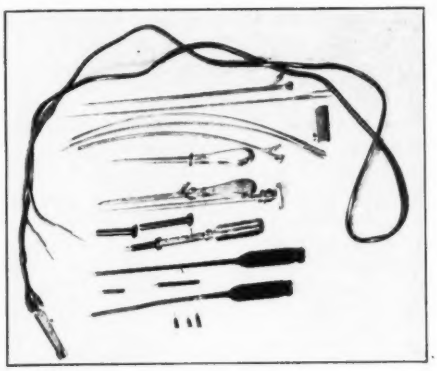

Fig. 1
Plate showing the Jacobaeus-Unverricht thoracoscope and electrodes designed by Ralph Matson.

The operation has been modified in detail by many operators. In this country Matson[1] modified the operation by dividing the adhesions with a high frequency current. He has devised very ingenious and satisfactory electrodes for use instead of a cautery. I think unquestionably the electrosurgical method is superior to the cautery method, because (1) hemorrhage can be more easily and accurately controlled; (2) the electrosurgical method does not produce smoke to obscure the field as does the cautery; and (3) the shaft of the electrode does not become heated as does the cautery, and there is less danger of injuring the lung from a heated shaft resting on it.

The technic seems simple, but the operation actually is very difficult. A refill should be given a day or two before operation in order to have as much room to work in as possible. The operator should make a thorough study of the stereoscopic films beforehand, so that he knows as far as possible the location of the important adhesions. The patient should lie on a small pillow on the sound side, and should be made as comfortable as possible. The skin is carefully prepared and the surgeon should exercise all aseptic precautions. Local anesthesia is used, care being taken to anesthetize skin and pleura. There should be no pain, but since the procedure may last two hours, the areas have to be reanesthetized.

The point of introduction of the trocar and cannula should have been predetermined from the study of stereoscopic films. A point is selected that the operator thinks will give him the best view of the main adhesions. More frequently the point elected will be the sixth or seventh interspace in the scapular line. In this case the arm will have to be pulled up and forward to pull the scapula away. Not infrequently one will find that the third or fourth interspace anteriorly is the optimum point.

A small puncture wound is made in the skin and the trocar and cannula are carefully inserted, the trocar is withdrawn, a hiss of air is heard, and one knows he has gone through the pleura. The thoracoscope is inserted and the light turned on. At this point the room must be darkened.

First, a careful inspection of the whole chest cavity must be made. The adhesions should be studied as to their situation, size, vascularity, and operability. One must carefully orient himself before proceeding. Then with the aid of the thoracoscope, a point is selected for introduction of the cannula for the electrode. It is inserted in the same way as the first cannula. The point for insertion will be in mid or anterior axillary line or mid clavicular line. One tries to select a point from which he thinks he can most readily reach the adhesion with the electrode.

The electrode or cautery must be under view all the time it is being manipulated. The trick of the operation is to place the electrode on the adhesion. It is very difficult to do, as one is looking at right angles to what he is trying to do.

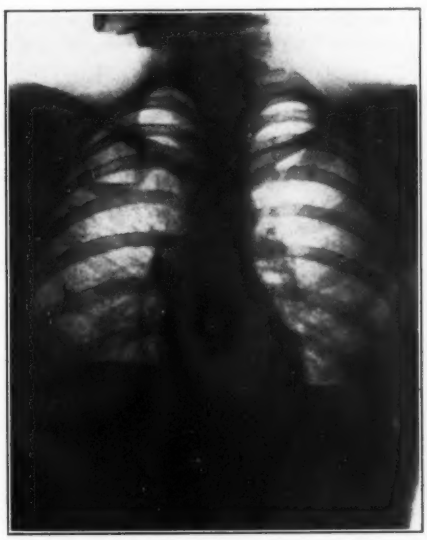

Fig. 2
Patient F. J., pulmonary tuberculosis, showing large cavity in right upper lobe.

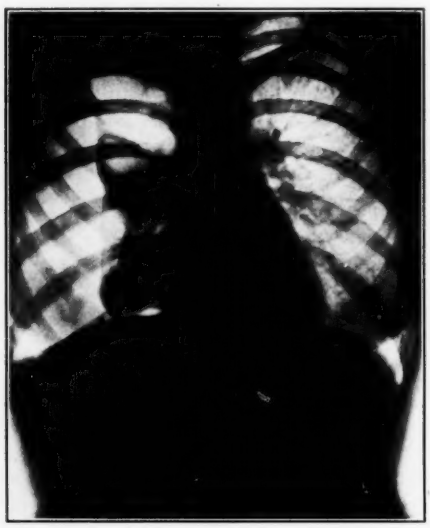

Fig. 3

Patient F. J., pulmonary tuberculosis. Same patient after one year of artificial pneumothorax. Cavity held open by one cord-like adhesion. Patient doing well clinically, but raises 10 c. c. positive sputum daily. Ideal indication for internal pneumolysis.

Adhesions as a rule are painless except at their parietal attachment. They should be divided as close to their costal attachments as they can be. Small adhesions are divided first and larger ones last, because after release of a large adhesion the lung may suddenly collapse and tear small ones. If one uses the electrosurgical method, he can alternately use the cutting and coagulating currents and prevent hemorrhage as a rule. If one uses the cautery, he should never use the cautery white hot, but always a dull red.

After all adhesions have been divided and before the instruments are removed, I usually insert 20 c. c. of a warm hexlyresorcinol solution as an added precaution against infection. The wounds may be sutured or not. A tight compression bandage is applied.

After operation the patient should be kept as quiet as possible and sedatives should be given to alleviate cough, as cough increases the subcutaneous emphysema. A pneumothorax refill should be given within three days. Postoperative effusion should be aspirated as indicated.

The operation is indicated in any case of pneumothorax which, after a period of three to six months, has not produced a satisfactory collapse on account of string, cord or band-like adhesions. It is contraindicated in cases of active febrile tuberculous effusion, and it should not be attempted unless there is reasonable assurance that a successful pneumothorax will benefit the patient.

While stereoscopic x-ray films and fluoroscopic examination will give considerable help in selecting cases for operation and in locating adhesions, thoracoscopic examination is the only means of determining definitely the operability of adhesions. The x-ray often fails to show adhesions present and often misleads the operator as to their character. It is the rule to find more adhesions present than are shown by the x-ray.

All adhesions cannot be safely divided. Surface adhesions should not even be considered. Many cord and band-like adhesions contain prolongation of cavities and lung tissue and one must be sure that the adhesion does not contain a prolongation of a cavity before he attempts its division. If he cannot be sure, the operation should be abandoned. Roughly speaking, if an adhesion is not over 2 cm. long, it should not be divided. String-like adhesions can be safely divided, but usually they are not important. Gloyne[5] has shown that many adhesions contain tubercles and at times these can be seen. They do not constitute a contraindication, but according to Matson,[1] their presence indicates an in-

Fig. 4

Ten days after division of adhesion. Note adhesion has been divided, lung completely collapsed, cavity almost closed. Note fluid level of postoperative effusion. Patient's sputum immediately ceased. Cavity entirely closed. She is still undergoing pneumothorax therapy.

creased danger that tuberculous effusion may develop after the operation.

The location of the adhesion is of importance. The majority of adhesions are apical or lateral. The lateral adhesions are usually the easiest and safest to divide, as they are often string or cord-like. The apical adhesions are usually shorter and thicker. It is not always necessary to divide them. Great care should be used when attempting to divide them, as the subclavian artery and vein are in close proximity and a little slip may be disastrous. Mediastinal adhesions, as a rule, are not important. Diaphragmatic adhesions are technically hard to divide because of the motion of the diaphragm. However, it will seldom be necessary to attempt their division, as phrenic neurectomy will often obviate the necessity of pneumolysis.

The complications of the operation are not many. The operations are well borne. Most patients have an elevated temperature for several days and a varying degree of subcutaneous emphysema, which does no harm. At least half of the patients develop a varying amount of serous effusion, which may call for aspiration, and which usually disappears without doing harm.

About 10 per cent will develop a persistent effusion, usually tuberculous in nature. In a small percentage it will develop into a true tuberculous empyema. However, tuberculous empyema is no more frequent after pneumolysis than it is during the course of artificial pneumothorax.

The real dangers of the operation are hemorrhage and mixed infections. Quite a few serious hemorrhages and at least three fatal hemorrhages have been reported. The danger of hemorrhage has been greatly reduced by the introduction of electrosurgery.

Infection is serious and may be exogenous or endogenous in origin. The former can be avoided only by a rigorous technic. The latter results from perforation of the lung and may occur immediately or as late as several weeks after the operation. It is a serious and often fatal complication. If such an accident does not prove fatal, it certainly leaves the patient in far worse condition than before. The only way to avoid this complication is by conservatism and extreme care in operating. Maurer[6] claims that no adhesion should be divided, but that all of them should be enucleated from their costal attachments. He is the only operator of large experience who has avoided this complication.

The results of the operation are excellent. The end-results belong to that of pneumothorax. The result of the operation is judged by whether the pneumothorax has been converted into a successful one or not. Jacobaeus,[7] Matson,[8] Unverricht[9] and Welles[10] have reported the largest number of cases, analyzing their results. Their combined results report a total of 831 cases operated upon, with 73.8 per cent successful results, 6 per cent serious complications and 1 per cent mortality.

My own experience is limited to 10 patients. Of these patients, in 3, division of the adhesions was found to be contraindicated and the operation was abandoned. In 7 patients, division of adhesions was indicated and the operation was done.

In five patients the operation was completely successful, the unsatisfactory pneumothorax being converted into a satisfactory one. In one patient the operation was technically successful, but not clinically successful, the cavity in the lung has never closed, even though the lung is collapsed completely. In one patient, several adhesions were divided, but there remained one which presented a technical difficulty that I was never able to overcome. One patient was operated upon twice, a total of 19 adhesions being divided. There occurred 3 slight exudates following operation that disappeared within three weeks.

One patient who had a pre-existing exudate developed a tuberculous empyema, which persisted for months and subsided without defeating the result.

One patient who was very ill and in whom only a thoracoscopic examination was done, developed pulmonary edema thirty-six hours after operation, but survived to die seven weeks later of his tuberculosis.

One patient developed a mild pleural shock on introduction of 10 c. c. of mercurochrome at the finish of the operation. He also developed a serous exudate that persisted for three months and required several aspirations.

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DISCUSSION (*Abstract*)

Dr. Paul H. Ringer, Asheville, N. C.—This procedure is being employed more and more and with greater success in suitab'e cases. I have never done the operation, but I have seen it performed several times, on half a dozen occasions by Dr. Ralph Matson, of Portland, Oregon, who is the pioneer in this country in this work, and several times by Dr. Moore.

Two things have impressed me in connection with the operation: first, its extreme technical delicacy and difficulty; and second, the need for conservatism first, last and all the time in determining how to deal with any given adhesion. While the use of the electrosurgical unit has minimized to a large extent the danger of hemorrhage which existed under the use of the old cautery, the operator must be very certain that he can completely surround an adhesion with his coagulating or cutting instrument, and that there is no lung tissue in the adhesion that he is trying to sever. The French have a proverb: "*Dans le doute, abstiens-toi*" (When in doubt, abstain.) This proverb should be the basic principle in all intrapleural pneumolyses.

In a large percentage of well-chosen cases, this operation will convert a partial, and therefore relatively ineffective, pneumothorax into a complete and most effective one; and it represents still another of the steps which modern surgery has gradually devised whereby a good chance is given to a far advanced case, if mainly unilateral, of obtaining quiescence and in many instances apparent arrest of the disease.

ENDOTHELIOMA OF THE SPLEEN WITH REPORT OF A CASE*

By GEO. T. CALDWELL, M.D.,
Dallas, Tex.

Primary malignant tumors of the spleen, although relatively infrequent, possess considerable interest because of the varied forms which they assume and the consequent difficulties in their classification. The part played by reticulo-endothelium in tumor production should be conspicuous in the spleen and less subject to confusion with epithelial tumors than in lymph nodes, thymus and tonsils.

Massive enlargement of the spleen is rarely due to secondary malignant tumors.

In 12,000 autopsies recently reported by Barron and Litman[1] only one spleen was encountered which weighed as much as 1,000 grams as a result of carcinoma metastasis, and only one melanosarcoma was responsible for a spleen weighing over 600 grams. In fact, the relative infrequency of secondary malignancy of the spleen has been the subject of some controversy. It has been variously attributed to some inherent resisting property or immunity on the one hand, and to comparative isolation because of complete lack of afferent lymphatics and various mechanical factors[2] on the other.

Smith and Rusk,[3] in 1923, could find only about 104 cases of primary splenic malignancy of all types in the world's literature and to these reports they added two cases diagnosed as primary endothelioma of the spleen. Approximately eleven additional cases were reported during the next five years as indicated by Howard.[4] Primary malignancy of the spleen was encountered only twice in 40,000 surgical cases at the Boston City Hospital and apparently only two cases have been reported from the Mayo Clinic.[5]

Considerable difficulty has been experienced in attempting to classify these primary splenic malignancies. Smith and Rusk[3] found two fairly definite groups of cases. One of these is variously designated as endothelioma, endothelial sarcoma or angiosarcoma, and the other is the group of lymphosarcomas, including representatives of both the lymphocytoma and reticulum cell types.

A third group is given the rather indefinite designation of primary sarcoma of the spleen, some of which had been diagnosed as round cell sarcomas, while others were more definitely of fibroblastic type. It is of interest to note that 19 cases were reported as carcinomas, and in spite of this diagnosis they were considered to be of splenic origin. It is probable that most of these were of endothelial or reticulo-endothelial derivation. Ewing[6] states that Weichelbaum, in 1881, briefly described three varieties of splenic sarcoma, namely, endothelial sarcoma, lymphosarcoma and spindle cell sarcoma, and he proceeds to describe sarcomas of the spleen under these three divisions.

It is apparent that some uncertainty has existed in regard to the nomenclature and classification of these tumors. The large celled types of tumor have been the source of most confusion, being variously classed as carcinoma, endothelioma, endothelial sarcoma, and probably also reticulum-cell type of lymphosarcoma. It was

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†From Baylor University, College of Medicine.

for these tumors that Menetrier suggested the non-committal term splenoma, a designation subsequently followed by several authors of case reports.

Presumably endotheliomas arise from either vascular endothelium or reticulo-endothelium. Those arising from vascular endothelium usually retain some angioplastic properties and constitute a fairly definite group of malignant angiomas or angio-endotheliomas, in some portion of which definite vascular structures are reproduced. Despite a related origin from the primitive mesenchyme, reticulo-endothelium differentiates into more varied structures.

Roulet[7] has recently reviewed the primary reticulo-endothelial sarcomas of lymph nodes and has suggested that these tumors should be divided into immature, mature and combined forms.

The tumors composed of immature reticulo-endothelium are large celled growths without a definite vascular arrangement. The cells are round, or nearly so, with a diameter of 15 to 20 microns. They are said to lie in syncytial bands, often with poorly defined cell boundaries.

The nuclei are round or oval and the chromatin is finely granular, but may form one or more prominent nucleoli. The larger cells form no fibrous framework and no collagen. However, argyrophil fibrils may be seen arising from the cytoplasm of the more differentiated cells.

To the mature form belong the tumors composed of cells which have the tendency to form a lattice-like framework of argyrophil fibers.

Their cells are definitely polymorphous; some are large oval cells resembling those of the immature tumors, while others are short spindle cells, anastomosing with each other by means of their fibrils.

All possible intermediate gradations between immature and mature forms are encountered.

The combined forms are found occasionally associated with Hodgkin's disease or with leukemia. Karsner,[8] in 1910, reported a case of Hodgkin's disease involving chiefly the retroperitoneal lymph nodes, in which a sarcomatous degeneration occurred with loss of much of the previous inflammatory character of the involved tissues and with the assumption of definite malignant properties. Hodgkin's sarcoma has since been recognized as a relatively infrequent development in Hodgkin's disease even by those who still consider this disease to be primarily inflammatory in nature.

These tumors are apparently of reticulo-endothelial origin, and usually give rise to polymorphous cell tumors which resemble closely the reticulum cell type of lymphosarcomas.

Connor,[9] in his study of bone marrow tumors, in an attempt to clarify the status of the Ewing tumor, has formulated three groups of tumors of endothelial type. The first is angio-endotheliomas, characterized by vascular differentiation and sinus formation and comparable to hemangio-endotheliomas observed elsewhere in the body. Second is diffuse endothelial myelomas with the poorly differentiated cells in small groups without any very definite structure; and third is a reticular type of tumor in which the cells are united by fine protoplasmic processes or fibrils to form a net-like structure.

Thus, it seems that related tumors of reticulo-endothelium arise in bone marrow, lymph nodes, spleen and probably also the thymus gland. These tumors vary in cell structure from the large round celled tumors frequently referred to as endotheliomas or endothelial sarcomas to the reticulum cell type of lymphosarcoma and the Hodgkin's sarcoma.

The primary splenic neoplasm here reported is of the large round cell type, with the formation of a fine argyrophil reticulum in the more differentiated portions, and with no definite tendency towards the formation of vascular structure. It is regarded as an endothelioma of reticulo-endothelial origin.

CASE REPORT

The patient was a poorly nourished white ma'e, 33 years of age, who was first admitted to a tuberculosis sanitarium because of severe hemorrhages from the lungs. No tubercle bacilli were demonstrated in his sputum and the lung findings were not typical for tuberculosis.

However, the nature of his illness was not recognized at this time, and he was not transferred to a general hospital until tumor masses made their appearance in the subcutaneous tissues of the trunk and neck. In fact, one or two of these nodules had been present for six months, and because of a syphilitic history the patient was given intensive antisyphilitic treatment, but without benefit.

After transfer to the general hospital, two biopsy examinations of subcutaneous nodules were made at an interval of 3 weeks.

One of these nodules was diagnosed secondary diffuse carcinoma of subcutaneous tissues and the other, lymphosarcoma, reticulum-cell type.

The patient at this time had 2,720,000 erythrocytes and 19,100 leucocytes with 89 per cent polymorphonuclears. Two urine examinations were negative except for a trace of albumin and a few hyaline and granular casts.

With the establishment of the diagnosis of metastatic

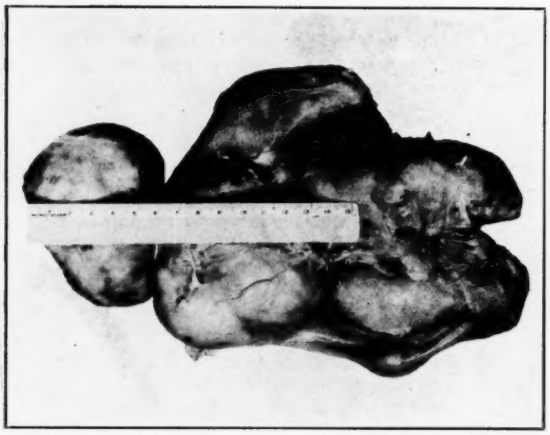

Fig. 1
Massive coarsely lobulated spleen.

malignancy, the patient was discharged from the hospital in fair condition, but with prognosis hopeless.

He was readmitted one week later with pain in the abdomen which he now stated had been present for eleven months.

He failed gradually and died six weeks after the second hospital admission.

Autopsy was performed one and one-half hours after death with the following significant findings.

The body was that of a markedly emaciated white male about 33 years of age. In the subcutaneous tistues of the thorax and abdomen there were at least 10 palpable tumor masses, the largest 6.5 cm. in diameter. The peritoneal cavity contained one liter of clear yellowish fluid.

There was a lobulated tumor mass 9 cm. in diameter in the omentum and adherent to the fundus of the urinary bladder. In front of the pyloric end of the stomach, there was a second mass 7.5 cm. extending along the lesser curvature of the stomach, and a retroperitoneal mass 9 by 7.5 by 6.5 cm. occupying a position behind the antral portion of the stomach. There were many smaller masses in the omentum and in the lymph nodes of the mesentery.

The pancreas was largely replaced by multiple tumor masses; at least 30 nodules could be seen adjacent to and within the pancreas. The retroperitoneal lymph nodes of this region contained small nodules, none of which was over 2 cm.

The liver was free of metastases, except for a nodule, 1.7 cm., in the capsule covering the anterior surface of the right lobe.

A grayish tumor mass 8 cm. in diameter occupied the site of the left suprarenal gland, and the right suprarenal was compressed by a mass 6.5 cm. Each kidney hilus was occupied by a tumor mass, and a partially necrotic nodule 3.5 cm. occupied the lower pole of the left kidney. The right lobe of the prostate contained a nodule 2.5 cm. in diameter, and a lobulated mass 14 cm. in diameter filled the small pelvis.

Each pleural cavity contained about one liter of clear yellowish fluid.

The posterior half of the left lung contained at least 25 separate discrete nodules, diffusely scattered, of which the largest was 3 cm. in diameter; the anterior emphysematous portion contained only a few scattered nodules.

There were numerous small tumor masses scattered throughout the right lung.

The peribronchial lymph nodes on both sides contained a few small tumor masses, the largest 2.5 cm. in diameter.

There were at least 5 small tumor implantations beneath the visceral pericardium.

The spleen was greatly enlarged and grossly lobulated. It measured 35x15x12 cm. and weighed 1,895 grams.

On section, the spleen tissues were nearly completely replaced by grayish tumor and remained only as a thin border of dark red, a few millimeters thick, contrasting sharply with the grayish tumor. The coarsely lobulated tumor measured 22x13 cm. on cross section, and an adjacent nodule was 5 cm. in diameter. The individual lobules of the tumor varied from 5 to 7 cm. with central hemorrhagic or cystic areas.

Because of the extensive involvement of the spleen and the wide dissemination of the tumor tissue in the abdomen, together with the metastatic nature of the pulmonary involvement, this tumor was thought to have its origin in the spleen.

Microscopic examination reveals a rather sharply demarcated tumor surrounded by compressed spleen tissue, which forms a fairly well defined capsule. The primary tumor mass is made up chiefly of the tumor cells arranged in compact masses surrounded by strands or bands of fibers. Some of these bands contain blood capillaries or sinuses, many of which are lined by

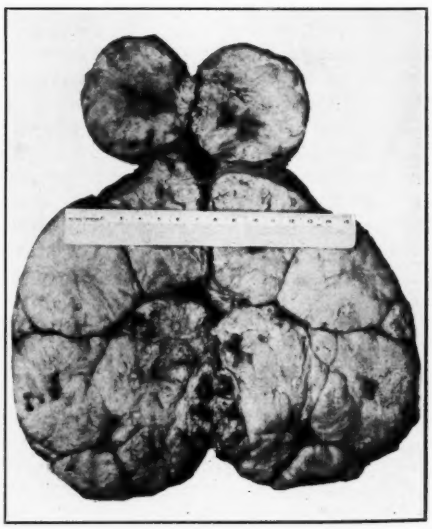

Fig. 2
Nearly complete replacement of spleen by tumor tissue.

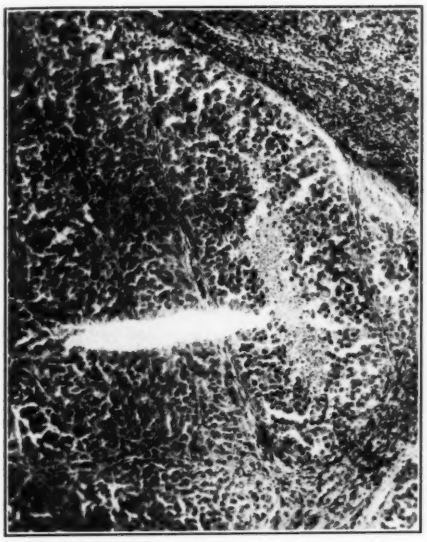

Fig. 3
Low power view of splenic tumor.

unchanged vascular endothelium. Only a few delicate fibrils can be seen within the cell clumps, in the more cellular portions of the tumor.

Although no definitely vascular arrangement is apparent, in some regions, an orderly row of tumor cells surrounds a partially filled space containing loosely scattered tumor cells.

There are other areas in which the tumor cells are more diffusely scattered between numerous fiber strands.

The cells of this tumor are mostly round, or oval or slightly angular, and only in the more fibrous portions do they approximate a spindle form. The tumor cells average about 20 microns in diameter, with moderately abundant clear cytoplasm. A few multinucleated masses are present. The nuclei occupy slightly more than half the diameter of the tumor cells. Each nucleus has a prominent peripheral band of chromatin, surrounding a finely granular and reticulated interior, which often contains a prominent eccentrically placed nucleolus which is acidophilic in its staining reaction; occasionally, two or more coarser chromatin granules are found in some of the nuclei, while other nuclei lack the coarser granulations.

Mitotic figures are moderately frequent throughout all portions of the tumor, except in regions adjacent to ischemic necrosis.

With Laidlaw's silver carbonate stain[10] it is apparent that in the more cellular peripheral portions of the tumor, the tumor cells lack argyrophil fibrils. They appear to lie free in roomy compartments surrounded by relatively coarse fiber strands. In other regions delicate fibrils seem to arise from, or to be continuous with the cytoplasm of the tumor cells and to form anastomoses with the fibrils arising from adjacent cells, and to fuse with the coarser fibrous bands which surround groups of the tumor cells.

The structure of the tumor remains remarkably constant in all of the different viscera involved. One striking characteristic is noted in all the sections of this tumor, namely, the capillaries and the blood sinuses are lined by practically normal endothelium.

The vascular endothelium does not seem to participate in the production of the tumor tissue, in marked contrast to the usual finding in angio-endotheliomas.

The tumor here reported is apparently a primary malignant neoplasm of the spleen. No other source was found which could explain the distribution and the location of the various masses.

The pulmonary and renal involvement was of the metastatic type, and although the regions of both suprarenal glands were occupied by rounded masses of tumor tissue, it was evident that one of the suprarenals was flattened over the surface of the mass and not invaded by it. The multiple nodules in and about the pancreas were clearly implantations and lymphatic invasions. The absence of metastases in the liver with such a huge tumor of the spleen is difficult to explain.

The occurrence of secondary involvement of the spleen with the formation of a tumor of this size and gross structure seems unlikely. Secondary carcinomas and melanosarcomas are not particularly infrequent in the spleen, but they are not known to form compact single or lobulated tumors such as the one here described.

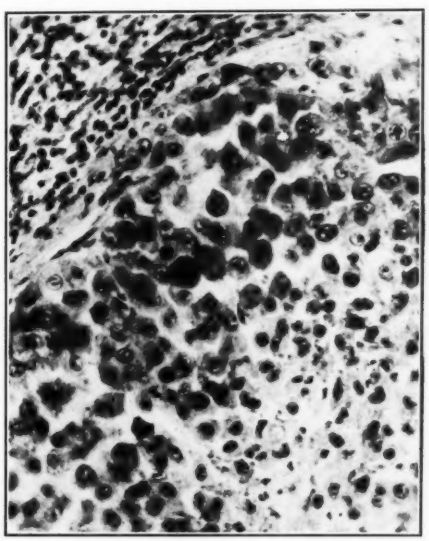

Fig. 4
Higher magnification showing details of structure of tumor.

Furthermore, no advantage is gained by considering any one of the intra-abdominal or subperitoneal masses to be the primary growth with a bulky metastasis in the spleen.

Taken as a whole, therefore, it seems to be imperative to consider this a primary splenic neoplasm.

It was impossible with this advanced tumor to determine the cells from which the tumor originated, except as indicated by a study of the cell form and the tumor structure.

This neoplasm possessed none of the characteristics of the recognized forms of fibroblastic sarcomas of connective tissue type, such as have been seen very infrequently in the spleen, and which are assumed to take their origin from the framework of the spleen or from its fibrous capsule. It does not reproduce cells of the lymphatic group, and it seems inappropriate in the light of the newer conceptions of the structure of the secondary nodules of the spleen to consider these tumors as lymphosarcomas, since the larger cells of the secondary follicles are probably of reticulo-endothelial type,[11] although it must be admitted that the exact relationship of the lymphoid cells to the larger cells of the follicles cannot be stated beyond contradiction. The endothelial cells of the blood sinuses of the spleen are evidently responsible for a group of benign and malignant tumor reproducing vascular structures. Wright,[12] in 1928, reviewed a group of seven angiomatous tumors of the spleen all of which had produced metastatic nodules of similar histologic structure in distant parts of the body. Some of these formed huge splenic tumors, one of which was reported as weighing 3,600 grams. The angioplastic nature of these tumors was a striking characteristic, which is apparently lacking in all parts of the tumor under consideration.

It is assumed, therefore, that this primary splenic neoplasm is of reticulo-endothelial origin, first because of the lack of any definite angioplastic tendency to suggest vascular endothelium as the source, and secondly because of the tendency of the cells in the more differentiated areas to assume a slightly elongated form with the development of delicate anastomosing argyrophil fibrils.

With this origin admitted, there might still be some doubt as to the propriety of the term endothelioma for this tumor. If its origin were fully established, it might preferably be designated reticulo-endothelioma, or the large round cell type of reticulo-endothelial sarcoma. This last term, although of bunglesome length, has the merit of suggesting that the more differentiated forms of these tumors of the polymorphous and spindle cell types have a closely related structure and identical origin.

This conception might easily remove the reticulum cell type of lymphosarcoma from its present associations and place it more definitely with the tumors of reticulo-endothelial origin.

SUMMARY AND CONCLUSIONS

(1) A case is reported of a massive primary malignant neoplasm of the spleen which is apparently of reticulo-endothelial origin.

(2) Metastases were abundant in lymph nodes, lungs and subcutaneous tissues, together with numerous peritoneal implantations. The liver was free of metastases except for a single nodule in its capsule.

(3) The tumor was of the large round cell type with a tendency toward alveolar arrangement, but without any definite angioplastic structure.

(4) Delicate argyrophil fibrils seemed to be formed by the tumor cells in the more differentiated portions of the tumor, but they were nearly completely lacking in the more cellular areas.

(5) The tumor is considered to be a primary reticulo-endothelioma of the spleen.

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DISCUSSION (*Abstract*)

Dr. E. von Haam, New Orleans, La.—The spleen is very rarely the site of a primary tumor or of metastasis. In cancer patients a marked atrophy of this organ can be observed, which seems to be significant. This clinical observation, together with the results of experiments of Brueda, Roffo and others, has led to the theory that the spleen represents one of the most important defense mechanisms of the body against the development of malignant growths. The reticulo-endothelial cells of the splenic pulp or the lymphatic cells of the malpighian follicle are believed to give to this organ its defensive power. Dr. Caldwell's case report shows an important exception to this theoretical rule.

Dr. Caldwell (closing).—The conception of the reticulo-endothelial system as an entity seems to be fairly

well established. Benign hyperplasias of reticulo-endothelium are recognized routinely in tissue examinations, but the exact relationship of its component cells to the formation of neoplasms is still open to question.

It seems likely, indeed, that those tissues which respond actively by hyperplasia in the defense mechanisms of the body should likewise share largely in the production of tumors, and that these tumors would appear in various histologic forms, simulating the variations seen in the hyperplasias. Several recent contributions have stressed the relationship of the benign hyperplasias of reticulo-endothelium to hyperplasias of the Hodgkin's disease type and Hodgkin's sarcoma, to the so-called reticulum cell type of lymphosarcoma and to certain endotheliomas or reticulo-endotheliomas of lymph nodes, thymus, bone marrow and spleen.

With this origin established, indefinite terms such as thymoma and splenoma on the one hand, and misleading expressions such as reticulum cell carcinoma or even reticulum cell type of lymphosarcoma, might then be replaced by more accurate designations.

TREATMENT OF CHOREA*

By ALFRED A. WALKER, M.D.,
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An attempt to evaluate the treatment of such a disease as chorea is fraught with great difficulty, because of the fact that there are wide variations in the severity of its symptoms and in their duration. Many forms of therapy have been used from time to time and all have had their enthusiastic supporters until some other method of treatment has been advocated to dampen their enthusiasm.

It is generally agreed that rest in bed is an essential in the handling of these cases, no matter what additional therapy is used. There should be not only complete physical rest, but as far as possible all sources of emotional and mental excitation should be removed. This is seldom possible in the home, and a complete change of environment is usually found to be necessary. It is a well known fact that removal to a hospital and isolation of the patient is invariably followed by marked improvement in a few days, and in this connection it should be borne in mind that all of the case reports we have are on hospital cases, where, presumably, rest and isolation have been carried out. This fact adds to the difficulty of determining how much of the improvement is due to rest and time and how much is due to drug therapy.

In the older text-books on *materia medica* it was rare to read of a drug that had not been used in the treatment of chorea. Of the older drugs, Fowler's solution of arsenic was the most widely used and the method of giving it was rigidly laid down. One started with two drops three times daily and increased one drop until twelve or fifteen drops were given three times a day, all the time watching for puffiness of the eye, *et cetera*.

No improvement was expected until the full dose was reached and it can readily be seen that this took time, which is usually a most valuable ally in any form of therapy. Personally, I never could convince myself that Fowler's solution or any of the more modern preparations of arsenic, such as sodium cacodylate, had any curative value.

Because of the close relationship of chorea to acute rheumatic fever, salicylates have had their day, but beyond their antipyretic or analgesic action they have had little if any effect on the choreiform movements.

The teeth and tonsils, and lately the sinuses, eventually were accused of responsibility for the development of chorea, just as they had been accused of being the causative factors of other ills too numerous to mention. As a consequence tonsils were removed, teeth extracted and sinuses drained with no apparent influence on the course of the disease or on the development of recurrences. The classical studies of Kaiser and others have demonstrated that this is true beyond any question. Furthermore, it is generally agreed that operation in the active stage of the disease invariably makes matters worse. However, since acute endocarditis often accompanies or follows chorea, there is some justification for the removal of definite foci of infection in the hope that reinfection of the endocardium may be lessened. This should not be done until several weeks after all symptoms of chorea have ceased.

The sedative group of drugs, such as chloral hydrate, bromides and in later years the barbiturates, have been in constant use as an aid in the control of chorea and, as a class, they are of undoubted value symptomatically, but they do not materially shorten the attacks.

The most recently used drug of this class has been phenyl-ethyl-hydantoin, a German drug also known as nirvanol. This drug, in common with others of its nature, frequently causes toxic symptoms characterized by an eruption on the body and high fever, and it was accidentally discovered in 1919 that marked and rapid improvement in the symptoms of chorea occurred

*Read in General Clinical Session, Southern Medical Association, Twenty-Sixth Annual Meeting, Birmingham, Alabama, November 15-18, 1932.

when these toxic symptoms developed. This improvement was apparently not due to the sedative action of the drug, as it was not noted unless toxic symptoms with high fever occurred. There have been many reports on the use of this remedy in the German literature for several years, and reports have been frequent in the English and American literature in the last two years, notably a report of 15 cases by Pilcher and Gerstenberger, of Cleveland, in the December, 1930, number of the *American Journal of Diseases of Children*. The drug is given in doses of 1½ to 3 grains three times daily and is kept up until fever develops followed by the characteristic rash. This reaction, or rather toxic manifestation, occurred in seven of the above mentioned authors' 15 cases in from four to fifteen days. The reaction is supposed to be due to protein shock, and numerous serious and alarming ill effects have been reported following its use.

In August, 1931, Sutton of New York, reported 24 cases of chorea treated by the intravenous administration of typhoid-paratyphoid vaccine in sufficient doses to cause a sharp febrile reaction. The average duration of the chorea in those treated by this method was 7.7 days for mild cases, 7.8 days for moderate cases, and 14 days for severe cases. This was in marked contrast to the duration of cases treated by the old method of isolation and sedation, which was 35 days in mild cases, 46 days in moderate cases, and 67 days in severe cases.

The method of treatment is as follows: commercial combined typhoid-paratyphoid vaccine is given intravenously, starting with an initial dose of 0.2 c. c. This is usually followed by a chill and a marked febrile reaction. The reaction begins about 20 minutes after the injection and the fever reaches its maximum in two to four hours, reaching as high as 105 to 106° in some cases. The fever remains high about one hour and then rapidly declines to normal or near normal. During the reaction the choreiform movements become worse and the patient is quite uncomfortable. The succeeding doses are determined by the degree of reaction obtained. If the fever is 105° or over the same dose is repeated the following day. If the reaction is less, as indicated by the height of the temperature, the dose is doubled and 0.4 c. c. is given. To maintain a satisfactory febrile reaction it is usually necessary to increase each succeeding dose, and there is a great variation in the amount necessary. The duration of the treatment is usually from a week to ten days.

The effect of the reaction on the chorea is immediate, as a rule. The movements are quite markedly diminished and improvement continues after each succeeding treatment.

Since the good effects of treatment depend on the fever produced, vaccine treatment would seem to have distinct advantages over phenyl-ethyl-hydantoin for the following reasons: (1) All cases can be made to react immediately without waiting for a period of days for the toxic symptoms to develop. (2) The treatment with vaccine is free of complications. (3) The results are as good or better. (4) The amount necessary to obtain a satisfactory febrile reaction is under perfect control.

We have not tried phenyl-ethyl-hydantoin, but have had a limited experience with typhoid-paratyphoid vaccine, three cases of which constitute this report. All these cases can be classed as severe cases.

Case 1.—Nettie McD., age 7 years, was admitted to the Children's Hospital on the service of Dr. Hughes Kennedy October 5, 1932. Her past history was essentially negative except for measles, pertussis and chicken pox. The present illness began three or four weeks previously, at which time the child became highly emotional and nervous. Ten days previous to admission her nervousness became extreme with almost constant jerking of the head. Aimless and powerless jerking of the arms and winking of the eyes was also present.

These symptoms increased in severity until she was brought to the out-patient department on the day of admission. Physical examination on admission showed a moderately malnourished girl with extreme restlessness and purposeless movements, most marked in head and arms. She was unable to speak, could not sit up and incoordination of all voluntary muscular activity was present. In addition there was marked muscular weakness. The teeth were dirty and carious, tonsils moderately enlarged and cryptic. The heart showed no enlargement or murmurs. The chest and abdomen were negative. The temperature was 100° on admission. The urine was negative. There were 9,850 white blood cells with 66 per cent polymorphonuclears and 34 per cent mononuclears. There were 3,630,000 red cells and 67 per cent hemoglobin.

The patient was put to bed in isolation and ½ grain of luminal ordered three times a day. October 6, the day after admission, there was slight improvement in the chorea, due no doubt to the isolation and the sedation. The nervousness was, however, still very severe. On October 8, 4 minims of typhoid-paratyphoid vaccine were given intravenously. There was a feeling of chilliness followed by an immediate rise of temperature to 103.2°, then a slight drop, followed by a further rise to 104.4°, which was reached in 8 hours. The temperature fell during the night and was 101° when she was seen in the morning. At the height of the reaction the patient was very restless, but the chart shows that she was distinctly better after the temperature subsided and was able to feed herself fairly well. On account of the rather severe reaction which did

not completely subside for twenty-four hours, no injection was given on October 9. The same dose of 4 minims was given on October 10, followed by the same type of reaction, the temperature reaching 106° in six hours, followed by a prompt subsidence to 99.4°.

On October 11, the same dose was repeated, although the patient was very quiet before the injection. The same procedure with the same dose was carried out daily for one week with constant and rapid improvement in the choreiform movements.

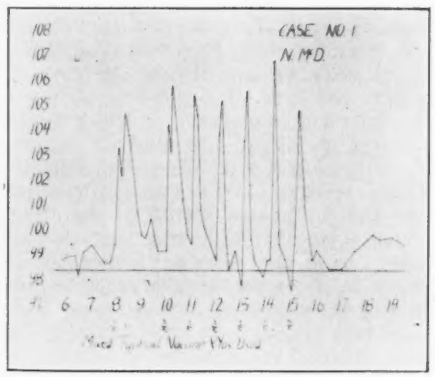
It might be interesting to show the behavior of the blood before and after the various treatments.

On October 10, 30 minutes before the second injection, the white cells were 8,650 with 47 per cent polymorphonuclears. On the same day, five hours after, the count was 7,050 with 68 per cent polymorphonuclears. This was at the height of the reaction.

October 11, 15 minutes before the third injection and 18 hours after the second, the count was 16,400 with 68 per cent polymorphonuclears, showing a rather marked increase. At the height of the reaction on this day the count had dropped to 11,000 with 68 per cent polymorphonuclears.

October 12, 15 minutes before the fourth injection, the count was 11,900 with 59 per cent polymorphonuclears. At the height of the reaction it was 10,000 with 67 per cent polymorphonuclears.

October 13, before the fifth injection, the count was 9,800 with 69 per cent polymorphonuclears. At the height of the reaction it was 10,400, 68 per cent of which were polymorphonuclears.



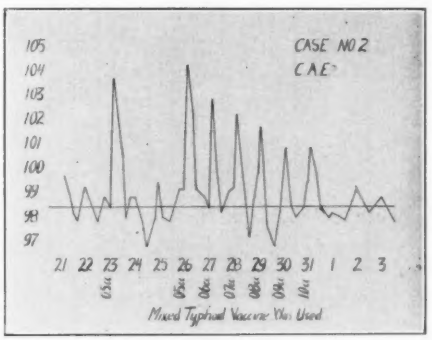
It will be seen that while there was a marked increase in leucocytes following the second injection, there was a tendency for them to become less rather than more following each succeeding reaction, in spite of the fact that improvement of symptoms continued.

After the seventh dose the general condition was so good that it was considered unnecessary to continue the use of the vaccine. The patient was relaxed and had good muscle control, although she still showed some muscular weakness. The improvement has continued to date and no further injections have been necessary. She is still in the hospital waiting for a favorable opportunity to have dental attention.

Case 2.—C. A. E., a white girl, age 7½ years, was admitted to the Children's Hospital December 21, 1931, as a private patient of Dr. S. P. Wainwright, to whom I am indebted for this case report. Her past history was that she had always been a nervous child, had pertussis, occasional colds and tonsillitis, but no rheumatic symptoms.

For several weeks before admission the nervousness had increased to a marked degree, so much so that her teacher asked that she be given medical attention. She was emotional, continually dropped things and became very clumsy in her movements. Hospitalization was advised when the child was first seen by Dr. Wainwright, but it was a week before the family followed this advice, during which time she became much worse.

On admission physical examination showed a moderately malnourished girl. There was inability to keep the feet and hands still. Her movements were aimless and incoordination was marked. She was unable to feed herself or talk distinctly. Her tonsils were moderately hypertrophied with no evidence of acute infection. The heart was normal except for a soft systolic murmur at the base, which was not transmitted. This was diagnosed as a moderately severe case of chorea. No treatment beyond bed rest and isolation was instituted for a period of two days in order to note the effect of these two simple procedures. No appreciable improvement having been noted, on December 23 0.2 c. c. of Alabama State Board mixed typhoid-paratyphoid vaccine was given intravenously and in two hours the temperature reached 104°. During the reaction the patient complained of headache, was very restless and vomited. This was given in the afternoon at 2:00 o'clock and the peak of the temperature was reached at 4:00 p. m., after which time there was a rapid decline to 99° the next morning. Her appetite was much better and the nervousness showed marked improvement. No more vaccine was given until December 26, at which time 0.5 c. c. was given. This resulted in the same reaction with the temperature reaching 104.2°. After this time the child was



given 6 daily injections of vaccine, increasing each dose 0.1 c. c. It will be noticed that the height of the reaction had a tendency to become less, due probably to the fact that the amount given was not increased sufficiently. Improvement was progressive and rapid and no further injections were necessary. The child was discharged January 11, 1932, cured. There has been no recurrence to date.

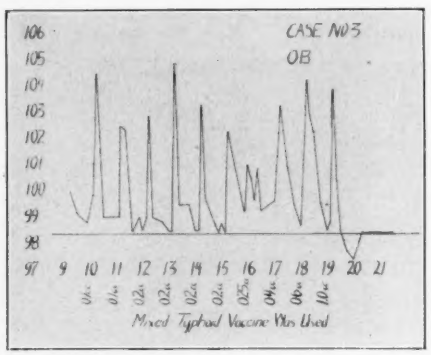
Case 3.—O. B., age 14 years, was a private patient of Dr. Stewart Welch in the South Highlands Infirmary. This boy had a rather sudden onset after returning home from a week's visit with relatives. Symptoms had been present nine days before admission to the hospital and had been getting progressively worse.

August 9, the day of admission, he showed extremely violent movements of the body and extremities. Facial grimaces were marked and he had great difficulty in talking. He was also unable to feed himself. The movements were so violent that it was necessary to guard the sides of the bed with boards. The temperature was normal and his physical examination was essentially negative except for the choreiform movements.

August 10, he was given 0.1 c. c. of mixed typhoid-paratyphoid vaccine, which was followed by a rise of temperature to 104.4°. He showed the usual restlessness and discomfort at the height of his reaction, but when the temperature returned to normal his movements were less marked.

August 11, 0.1 c. c. was repeated, followed by a temperature of 102.2°. Following this his speech was better and his violent movements had improved to such an extent that the boards on the bed were no longer necessary.

The doses, together with the dates given, can be seen on the slide and there was progressive improvement following each reaction. This patient was so much better on August 20 that all injections were omitted for a period of 4 days, at which time he became more restless and had difficulty in feeding himself. He was given 0.5 c. c. and his temperature rose only to 102°. The doses were rapidly increased on succeeding days as follows: 1.5 c. c., 2.5 c. c., and 3 c. c., but the reactions obtained were not so great as the first when only 0.1 c. c. was given.



The boy remained in the hospital seventeen days and was discharged with mild chorea, manifested by minor grimaces, some uncertainty in speech and at times slight difficulty in feeding himself. Following a respiratory infection he had a recurrence five months after discharge. The blood count in this case showed a slight increase in leucocytes after the early reactions, but the later injections resulted in no difference in the count.

NUTRITIONAL CATARACT IN THE NORWAY RAT (MUS NORVEGICUS)*

By WILLIAM C. LANGSTON, M.D.,
and
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Since the authors[1] demonstrated that cataract develops in young albino rats given a vitamin G-deficient diet, in nearly 100 per cent of the cases, attempts have been made to develop the same lesion in other animals. Wild gray rats (Norway rats, *Mus norvegicus*) were captured in cage traps and bred in the authors' laboratory. Some difficulty was experienced in getting the wild rats to suckle their young in captivity, but enough were raised to start a small colony and the succeeding generations cared for a larger number of their young. Sherman's diet 13,[2] supplemented with lettuce and fresh lean meat, was used as a stock diet.

Second and third generation young were separated from their mothers at 21 days of age (25 to 40 grams in weight) and were given a vitamin G (B_2) deficient diet and distilled water *ad libitum*. The composition of this diet (diet 625) is as follows: casein, freed of water-soluble vitamins with 60 per cent alcohol, 18 per cent; Osborne and Mendel salt mixture, 4 per cent; cod liver oil, 2 per cent; butter fat, 8 per cent; and corn starch, on which has been evaporated an 80 per cent alcoholic extract of rice polish, 68 per cent. This diet contains an adequate amount of the antineuritic vitamin (B or B_1) for normal growth of the rat, and is deficient in the heat-stable anti-dermatitis vitamin (B_2 or G). Whether it contains, or is deficient in, the more recently reported growth factors of the vitamin B complex, is not known. To prevent coprophagy, the animals were housed in metal cages on raised screens.

The manifestations of the vitamin deficiency were not very different from those observed in the albino rat fed the same diet. Owing to the persistent wildness and viciousness of the animals, they were handled much less frequently, and hence some of the less evident findings seen in the albino rats of previous experiments were either not seen at all or with much less frequency. Such signs include mild hemorrhages

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Photograph of a Norway rat showing cataract resulting from a deficiency of vitamin G (B_2). The pupils were dilated with atropine for photograph.

of the mouth, nostrils, or anus, mild diarrhea, and small cutaneous ulcers.

Alopecia was the first and most pronounced sign observed, some animals becoming practically denuded. Stomatitis with salivation and labial crusting occurred in many animals. Ulceration of the skin was fairly frequent and, in some cases, involved the deeper layers or even the underlying muscle. Conjunctivitis often occurred with sanguino-purulent discharge, causing crusting and sealing of the eyelids.

The first sign seen in the globe of the eye appeared as a grayish, lusterless clouding of the anterior portion. This, upon ophthalmoscopic examination, proved to be keratitis with, or without, vascularity of the cornea. Not infrequently this condition cleared up, leaving the eye relatively bright again. Dilatation of the pupil with 0.5 per cent atropine sulphate solution revealed cataract, as manifested by a whitish or grayish-white appearance of the pupil (see accompanying figure). This opacity persisted until death, at which time some of the eyes were taken for histological section. Examination of all such sections revealed the presence of cataract, as manifested in lens fiber separation or destruction.

A total of 39 Norway rats were placed on the deficient diet; of these, 5 died during the first 36 days and were therefore eliminated from the series. The earliest time at which cataract appeared was the forty-sixth day, while the average time of appearance was 72 days. Of the 34 rats that lived beyond the minimum time of appearance, 5 failed to develop cataract, but all of these 5 died before the seventy-second day. No sections were made of these animals, but it is possible that some of them might have had early lens destruction. Of the 29 remaining animals, 23 exhibited cataract during life, 19 of which could be seen with the naked eye, and 4 additional were seen with the ophthalmoscope. Of those that died before cataract was manifest, 6 exhibited lens changes in microscopic section. Thus, of the total 34 on experiment, 29 were found to have cataract, as determined by one or more of the above methods of observation. Therefore, the incidence of cataract was 85 per cent in animals living up to the minimum time of appearance, while the incidence was 100 per cent in rats living up to the average time of appearance.

Donaldson[3] states that the albino rat (*Mus norvegicus albinus*) is undoubtedly a variation of the Norway rat, but that no exact record is available as to the time when the albino was developed. At any rate, the two forms are now many generations distant from each other, even though they are of common ancestry.

The experiment here reported demonstrates that the development of cataract on a vitamin G-deficient diet is not restricted to the albino rat. It also demonstrates that rats from the wild state, of practically unknown dietary history, will develop cataract in a large percentage of cases if placed on such a deficient diet.

SUMMARY

As had previously been demonstrated in albino rats, cataract and keratitis develop in Norway rats deprived of vitamin G (B_2) in nearly 100 per cent of cases.

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EXHAUSTION STATES WITH PELVIC SYMPTOMS*

By W. O. Johnson, M.D., F.A.C.S.,
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No medical specialty is isolated: a definite overlapping exists between the different branches, connecting one with another. Those closely linked with gynecology are psychology and psychiatry, and a number of patients who

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*From the Gynecological Department, University of Louisville School of Medicine.

fall within the psychiatric field are first seen by the gynecologist because their complaints are referable to the pelvis.

Although it is in no part the duty of the gynecologist to treat these minor or major psychic disturbances, he should be psychiatrically alert, and in the examination of each case should have in mind that the symptoms may arise from a psychiatric background.

It is my belief that the gynecologist should explore the heredity, habits, environment, social status and personality of the individual as well as the physiology and pathology, and endeavor at all times to ascertain the cause of the conditions producing symptoms. Conservatively speaking, we all know that over 25 per cent of our practice is made up of the so-called "neurotics" and over 65 per cent of our ambulatory patients are suffering more from dreads or fears than anything else. As has been aptly said, "There are more indigestion and illnesses above the neck than below it."

Many people who, under normal conditions, may cope satisfactorily with life, however, with the complications of modern life and especially under the severe social and economic stress of recent years are inadequate and are unable to contend with the various problems that confront them.

My reasons for presenting this essay are to stimulate discussion, obtain a better understanding of this type of individual, and, if possible, to formulate more satisfactory methods of treatment in this type of case.

Let us study a group of cases which have been treated in the Louisville City Hospital during the years 1929-1932. We all should expect a higher percentage of inadequate individuals in dispensary practice than in private practice.

These cases were selected on the basis that symptoms referable to the pelvis must be recorded in their chief complaint, and that at no time did they have a positive Wassermann. On this basis 50 cases were found, and at some time during this period they have all been seen by me.

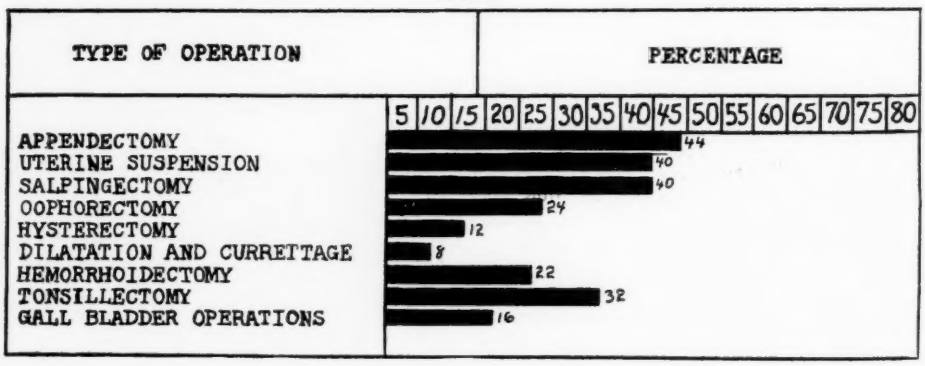
The most outstanding feature of this group is that they have gone the rounds of treatment in most of the departments and have not as yet received any permanent relief. Some of you may say that these are just a group of "neuros" and why bother about them? It is because of this attitude that I think most such patients are what they are now. There is a cause and a treatment for a "neuro" and it is for us to find and use it, and not discard the case as hopeless.

In an analysis of the family history of these cases, 25, or 50 per cent, had a history of nervous temperaments, "nervous breakdowns," or insanity in the family; 16, or 32 per cent, had a definite history of tuberculosis; 7, or 14 per cent, had a history of thyroid dysfunction. We see from this that these individuals come from inferior stock that has mental and constitutional stigmata. The past of such a patient is just as pertinent as her present.

Let us look next into the past history. Forty-two, or 84 per cent, had been pregnant with an average of 3 pregnancies, the greatest number being 12. Twenty-one, or 42 per cent of them, have had miscarriages, with an average of two miscarriages to a patient. Seventy-eight per cent of these patients stated that they had not felt the same since the birth of the first child.

In less than 24 per cent of these cases was there more than a grade school education and we know that feeble-minded people are 26 times

Table 1



more liable to develop disturbances than the normal.

Thus, from a study of the family history and past history it is evident that we have an inferior stock to bear the burden of pregnancies, together with the exhaustion of caring for the children under difficult circumstances. What can we expect?

Let us first briefly examine the operations performed on this group of patients. As far as can be determined, 68 per cent of the operations were performed by private physicians outside of the City Hospital. (*Table 1.*)

In 16 cases a number of the operations were combined at one time. Six cases had 2 exploratory laparotomies; 3 cases had 3 exploratory laparotomies; 1 case had 3 exploratory laparotomies in 7 weeks. A great majority have had more symptoms since the operation than before.

Such a high percentage of operations indicates that the diagnosis seems to have been reached by surgical exclusion. Sixty per cent of the patients implied that they had not been benefited by the operations, while some had temporary relief for a few months, and later developed another chain of symptoms. With a sick mind and a tired body, when regular life work was resumed and the same conflicts encountered, it is to be expected that other symptoms would result.

Operation upon the pelvis, because of the superstition associated with it, carries a greater psychic affect than operation upon any other system. Surgical operations and chronic illnesses have been the cause of over 31 per cent of cases of invalidism in such patients.

In 22 per cent of these cases operations were advised against. However, the patient was subsequently operated upon elsewhere, and later returned to the Clinic. An analysis of pelvic disease in these 11 cases shows that 82 per cent of the patients had apparently normal pelves for multiparous women, with only slight endocervicitis and certainly not sufficient disease to produce the multiplicity of symptoms.

Malnutrition, nervous instability and other general symptoms which we now will analyze under systems were present in these cases, and will be reviewed as follows: (*Table 2.*)

The outstanding symptom is dizziness, which may be interpreted as inefficient cardiovascular control, most commonly associated in early adult life with exhaustion or severe anemias.

The next two symptoms of palpitation of heart and hot flashes bespeak more the lack of cir-

Table 2

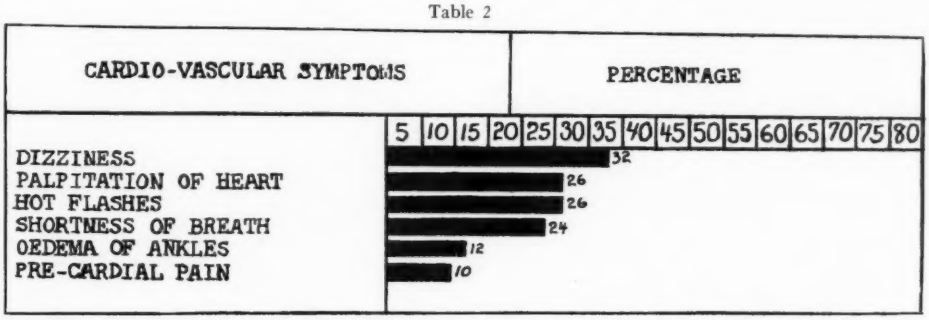
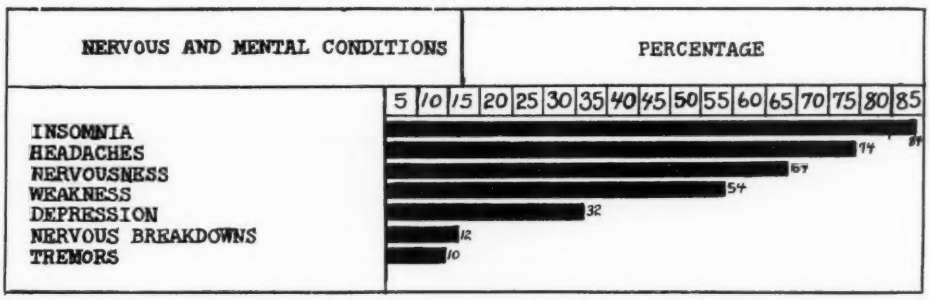


Table 3



culatory balance or of fatigue, and the remainder of the symptoms under this group may be ascribed to evidences of circulatory impairment.

In *Table 3* we have the symptoms referable to nervous and mental spheres.

What condition is more productive of exhaustion than insomnia? It was present, you notice, in 84 per cent of cases; perhaps the rest of the symptoms in this group may be regarded as toxic in origin, caused by the disturbances in the metabolism of the body as a result of disturbed functioning of the sympathetic nervous system, and the glands and organs which it supplies and controls. It leaves us, then, to determine the cause of insomnia. Cannot this be fear?

Next we group the gastro-intestinal and genito-urinary systems together in *Table 4*.

Are not the above an expression of dysfunction of the controlling sympathetic nervous system and the symptoms the result of them? Constipation may aid in increasing toxemia in these cases.

PELVIC FINDINGS AFTER OPERATION

Let us next consider the pelvic findings after operation.

(1) Seventy-six per cent had pain in the lower abdomen: (a) pain in the right lower quadrant, 34 per cent; (b) pain in the left lower quadrant, 42 per cent.

(2) Thirty-four per cent had a falling down feeling in the pelvis and backache.

(3) Twenty-four per cent had menstrual disorders.

(4) Twenty-six cases, or 52 per cent, had chronic endocervicitis and vaginal discharge.

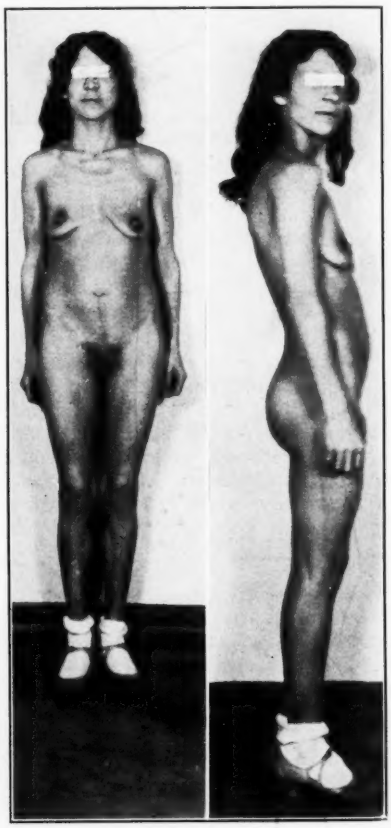
(5) Eight cases, or 16 per cent, had relaxed vaginal outlet.

(6) Uterus normal size and in anterior position, 22 cases, or 44 per cent.

(7) The uterus was absent in six cases, or 12 per cent.

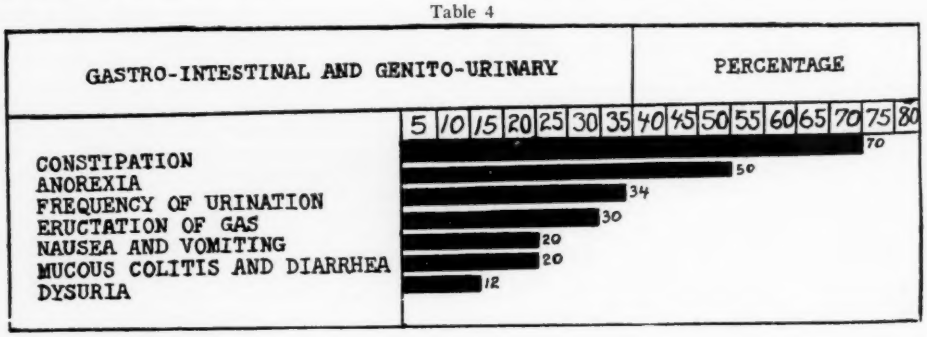
(8) Vaginismus was present in one case, or 2 per cent.

(9) Adnexal masses (ovarian cysts) were found in three cases, or 6 per cent.



Typical case. Two abdominal operations and subjectively worse.

Table 4



Aside from the usual adhesions and postoperative findings there were no outstanding factors that really contributed to the profound symptoms that were complained of by the patient.

LABORATORY DATA

Let us next examine the laboratory findings in these cases.

The results given are the average for the 50 cases, or where all the cases were not given the special tests, the number of cases is given and the average taken.

Red Blood Count.—Ninety per cent of cases; average 3,646,173.

White Blood Count.—Ninety-six per cent of cases; average 7,114.

Hemoglobin.—Seventy-six per cent of cases; average 70 per cent.

Lymphocytes.—Seventy-six per cent of cases; average 30 per cent.

Polymorphonuclears.—Seventy-six per cent of cases; average 70 per cent.

Blood Pressure.—Lowest 100-60; highest 160-105; average 124/72.

Basal Metabolic Rate.—Twelve cases, or 24 per cent, were normal. Four cases, or 8 per cent, between minus 14 and minus 17. One case, or 2 per cent, was plus twelve.

Phenolsulphonephthalein Test.—Fifty-four per cent of cases averaged 69 per cent secretion in two hours.

Non-Protein Nitrogen.—Fifty-four per cent of cases averaged 24.5 mg. per 100 c. c. of blood.

Gastric Analysis.—Forty-two per cent of cases average free hydrochloric acid 21, combined 28, total 49.

Graham-Cole Test of Gallbladder.—Fourteen cases, 28 per cent negative.

X-Rays of Gastro-intestinal Tract.—Eight per cent of cases had spastic colitis; 44 per cent were essentially negative to x-rays.

So we see from a rather exhaustive study of these cases that we have not, as yet, discovered any outstanding pathological condition either in the systems or from laboratory findings. But we still have the patients with their manifold complaints. Moreover, they have had the majority of their symptoms since the onset of the illnesses. Yet even after operations and months of treatment in the different departments, they have remained without any permanent relief.

What, then, is the cause of their trouble? Fundamentally, psychologically and physiologically these individuals differ from the normal, and their past histories must be taken into account in any consideration of their problems. Their inherited taint, together with environmental mal-adaptation and the resulting impaired functions manifest themselves in symptoms.

After a careful personal study of these cases, 64 per cent of the origin of the symptoms can be traced directly to economic and social disturbances, the result of the husband's loss of a job, with consequent deprivations and unrest. Twelve per cent can be traced to infidelity on the part of the husband, which, in most instances, occurred because of his idleness. The remaining 24 per cent of the cases have been of such long standing, with repeated recurrences and "nervous breakdowns," that a definite etiology could not be determined.

There are distinct mental states that strongly affect the individual and render women susceptible to physical exhaustion with symptoms referable to the pelvis because of the very nature of the fear and worry implied. These conditions are partially as follows:

(1) Fear of repeated pregnancies. (a) Frigidity, dyspareunia, unsatisfactory intercourse.
(2) Marital dissatisfaction.
(3) Infidelity.
(4) Specific infections.
(5) Economic and social unrest.

Fear or anxiety is the prime cause of the exhaustion, both of mind and body, which may result in innumerable symptoms. I prefer to call the class of cases reviewed exhaustion states rather than attach to them some psychiatric nomenclature, because I believe the great majority of these cases are the results of anxieties and fears and the symptoms are produced by resulting exhaustion and subsequent dysfunction in inadequate individuals.

With the onset of fear which is followed by worry, an exhaustion state results inevitably, and exhaustion plays the greatest part in the breaking down of this inadequate individual. Such prominence to exhaustion may not be admitted by some physiologists, but I believe that exhaustion has a larger share in the promotion of diseases or disorders than any other single causal agent, and we may say that it is really the central factor around which the whole symptom complex is built; the damper to success, the closed door to desire, a foe to happiness, an enemy to energy and a cause of lowered resistance.

The exemplar of these 50 cases which I have selected and reviewed is a patient whom we have to see and treat constantly. Her care may fall into the hands of a medical man who treats symptoms alone, or one who earnestly endeavors to find the disease and treat it. But in this type of case the patient's chance for recovery is slight unless she is fortunate enough to turn to

a physician who will treat the patient as well as her symptoms and disease.

Probably in no other type of case is it more necessary that the patient be approached as a psycho-biological unit and the individual treated as a whole, together with the disease and the symptoms. To do this conscientiously, the complete confidence of the patient must be gained. One of our greatest problems is to get the patient to lay the cards on the table, face up, to bare her whole secret life and impulses. Modesty restrains in many cases, self-preservation and self-respect keep worries, doubts and fears suppressed within her consciousness until they have produced havoc. The problem must be sympathetically approached, the patient permitted to tell her own story in full, a careful history taken and a painstaking physical examination made. There must follow a full discussion with the patient of her instincts, emotions, associations and repressions until her confidence is finally gained. Only then will sufficient data be obtained properly to classify her disorder as organic or functional.

As we are at present most concerned with the functional disorders, the organic conditions will not be discussed. Functional disorders constitute a large proportion of the cases applying for relief, and it is the proper handling of these problems that gives us the most trouble.

Some of the usual methods of approach in the past have been rest, stimulants and diet. The rest and diet are most essential, but in the majority of instances, do not stimulants tend to drive on an already overworked mechanism? Rest, too, although most essential and absolutely necessary, must be used judiciously. If the person is given absolute rest and permitted to continue her introspective tendencies, or advised to travel, we are postponing an environmental adaptation, for unless the patient can be taught environmental adaptation, our success in treatment will never be permanent. The patient cannot always be resting or taking trips; she must adapt to an environment in which she can function satisfactorily. Diet is absolutely essential, but we must guard against fads and fancies that are likely to make these patients too circumspect about their diets and cause them to center their complaints on gastro-intestinal conditions. If practical common sense rules of hygiene be applied to the individual's case, and she is taught normal variations in her particular condition, the result will be much more beneficial than the establishment of a tangential attitude in any one field.

The combination of exhortatory and sedative methods has also been much used. The hale and hearty slap on the back and the encouraging admonition, "You are all right; go home and forget it," will not cure these patients; it will only make them antagonistic towards the profession and lead them to seek sympathy and relief in the cults. Sedatives may for a period relax the tense nerves, but will not remove the cause of the trouble. Nor can these people be dissuaded with any avail, for their complaints and pains are too real to them.

Endocrine therapy has been exploited with an enthusiasm not to be justified by the results.

All of these methods are purely empirical and followed along lines that may be applicable to the mass, but are not suitable for desirable results in such individuals.

A better and more permanent solution to the problem, and one of the utmost importance, is to direct our investigation and thought towards finding the etiological factor which determines the psychology and pathology of these individuals. After the etiological factor is found the physician is then in a position to apply general scientific technic and principles to the solution of the problem in the individual he is asked to treat.

Some of the principles one may pursue in the solution of such a problem can be summarized as follows:

(1) Both the patient and the physician should be sure that organic disease does not exist, or, if present, that it could not explain the symptoms present.

(2) The patient must be made to feel that the physician knows her symptoms are real, as indeed they are, and that they, too, will not be discarded as imaginary or dismissed lightly.

(3) The physician should explain and show how symptoms can occur in the absence of organic disease and point out the cause for symptoms in the patient's unconscious emotional life.

(4) The physician should help the patient to readjustment by teaching her to realize her mental and physical limitations, to know the normal and to face her problems, and through this rehabilitation to adjust herself to her environment.

(5) There should be a long follow-up of the case and the physician should make himself available to the patient for guidance, consultation and encouragement.

(6) Finally, psycho-analysis, when indicated, should be done only by those especially trained

for it, and we shall find cases in which it is needed to be relatively few.

In spite of the increased knowledge of morbid anatomy and skill in surgery, the work of the gynecologist lies open to criticism if the personal factors of his patients are not taken fully into account. The physician who, in addition to examining his patients, discusses and explains their symptoms, and stimulates them to a better attitude, is the greatest asset to his profession. To such a one may a patient confidently turn, asking,

"Canst thou not minister to a mind diseased,
Pluck from the memory a rooted sorrow,
Raze out the written troubles of the brain,
And with some sweet oblivious antidote
Cleanse the stuff'd bosom of that perilous stuff
Which weighs upon the heart?" —*Macbeth.*

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DISCUSSION (*Abstract*)

Dr. Thomas Benton Sellers, New Orleans, La.—I agree with Dr. Johnson that a complete physical examination, with special attention to the pelvic organs, is of primary importance, as even minor gynecological disorders, if not corrected, may lay the foundation for mental and nervous symptoms.

All gynecological conditions which can be managed in the office should be treated immediately, and, at the same time, the gynecologist should gain the confidence of the patient and attempt to relieve all worries and fears, such as those which Dr. Johnson has discussed thoroughly in his paper. Thus, he may help the inadequate individual to adjust herself to her social and economic environment. Abnormalities of questionable clinical importance need not be revealed to the patient herself because of the possible psychic effect of such knowledge, but, for the protection of the physician, it is wise for him to inform some responsible member of the family of his findings.

Dr. Johnson states that 42 cases had been pregnant and 78 per cent of these gave a history of symptoms starting after the birth of the first child. My clinical experience would lead me to look for a causative factor in some unrecognized anatomical injury sustained at the time of delivery. It is a conceded fact that most cases following delivery have varying degrees of endocervicitis as well as of relaxation of the perineal outlet.

At his examination following operative work, Dr. Johnson found 52 per cent of his cases still suffering with endocervicitis, 16 per cent with relaxed perineal outlets, 90 per cent with an average red blood count of 3,646,173, and 76 per cent with an average hemoglobin of 70. These pathological findings, even in their milder forms, are capable, in my judgment, of explaining a great many nervous symptoms.

For these reasons, I feel that many of the symptoms which Dr. Johnson mentions, such as insomnia and headaches, would disappear if attention were given to free elimination in the intestinal tract, if the focus of infection in the cervix were eradicated, the borderline cases of perineal relaxation repaired, and the secondary anemia corrected.

The careful gynecologist is seldom an offender in laparotomizing the "inadequate individual" for conditions such as congenital retroversion of the uterus and follicular ovarian cysts, but, unfortunately, the untrained gynecologist and the general surgeon place too much stress upon these clinically unimportant abnormalities and often subject these patients to unnecessary laparotomies. As Dr. Johnson states, the patients are not only not relieved, but are usually worse after operation.

It is extremely important that conservative surgery be practiced in gynecology, but timely operative procedures must not be postponed in the guise of practicing conservatism. A conservative gynecologist is one who is radical when radical measures are indicated.

Dr. John F. Denton, Atlanta, Ga.—We are rather prone to ascribe all a woman's symptoms to any pelvic abnormality that may exist, and to fix our minds and the patient's mind on this condition. Though pathologic pelvic tissue or organs should be removed, the results will be disappointing unless we take into consideration the many factors enumerated by Dr. Johnson. This is particularly true in the class of patients

from which he has drawn his statistics, but it is by no means confined to this class. We find the same problem in those on a higher social, economic and intellectual plane.

In the class that is forced to consult the free clinic the problem is as much a sociological as a medical one. The physical disability, if one exists, should of course be removed, but we should be reasonably sure that there is an actual physical disability.

From this point on, the problem is hardly a medical one, though an understanding physician, gynecologist or psychiatrist may be of great help. We cannot formulate a specific treatment, for it must be a study of each individual. Sometimes the treatment is best applied to the husband or other members of the family. If the patient be above the average of intelligence in the class under discussion, sometimes a thorough explanation of the cause of her symptoms will be a great help to her; but where the environment cannot be helped, where the social status cannot be changed, the solution is difficult. Dr. Johnson's statistics show that surgery gives a very small percentage of cures and we should be careful not to promise too much from any operative procedure, even when a definite pathological condition exists.

Dr. Walter S. Rountree, Birmingham, Ala.—Throughout the pages of medical history one finds many dark spots which are but shadows of our inability to fathom the etiology of many human ailments and still more pronounced is our inability to produce curative results. Every branch of medicine and surgery has these stumbling blocks which impede us in reaching the desired goal. Many of them are found in gynecology.

I believe the great majority of the cases described are the results of anxieties with the resulting exhaustion and subsequent dysfunction of abnormal individuals.

In these patients we often fail to find any outstanding abnormality either in the physical examination or from laboratory tests. Still we have the patient with many complaints and a long train of symptoms that has worried her since the onset of the illness.

Functional disorders constitute a large per cent of the cases applying for relief and it is the proper handling of these conditions that gives us the most trouble.

If practical common sense rules of hygiene are applied to each case we are more apt to "get somewhere" in relieving these patients than by the establishment of any other line of treatment. Drugs may relieve for a little while, but they will not remove the cause of the trouble, and soon the patient loses confidence in the physician and she goes her way, seeking sympathy and relief in the cults.

If we direct our examination towards finding the cause of the mental and physical condition of these individuals we shall be in a position to apply general scientific principles to the solution of their problems.

Dr. Johnson (closing).—The conservative surgery indicated in these cases should be done, not with the hope of permanent cure, but as an aid in building up their physical conditions.

Every step should be carried out to enable the patient to conserve her energy and to keep her physical condition in an optimum state at all times.

When conservative surgical measures are indicated, the first operation should be as complete as possible.

These are cases that we all see. Our best results are obtained after a careful consideration of the psychobiological unit and after correction of abnormalities and painstaking sympathetic guidance of the individual to aid in her satisfactory adaptation to her environment.

THE TREATMENT OF MALIGNANT EPITHELIAL NEW GROWTHS OF THE URINARY BLADDER*

By CURTIS F. BURNAM, M.D.,
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The treatment of cancer of the urinary bladder is in a stage of flux and confusion. Progress is being made steadily in operative surgical methods, in electrosurgical procedures, and in the technical application of radium and x-ray radiation. Contrasted with cancer in some other organs, the technical problems of both diagnosis and treatment are complicated. A practical and efficient command of all cystoscopic methods is indispensable in the original diagnosis, in the treatments, and in following the progress of the disease under treatment and subsequently. Such knowledge is possessed only by the competent urologist or gynecological urologist. There can be no question that the men engaged in these specialties must bear the chief burden in carrying out the program of treatment, whatever it may be. Not every urologist or gynecologist is a competent surgeon in this somewhat difficult field. Very few men are capable of successful ureteral implantations in the bowel, which is necessary where a complete cystectomy is contemplated; still fewer of these men are familiar with accurate methods of dosage and skillful employment of radium and x-ray radiation; nor do the number of cases which any one man has give the opportunity to develop this proficiency. Under the circumstances, it seems obvious that there should be efficient team work, and that the urologist should make use of the very expert surgeon in a few cases, and of the radiologist in the great majority of his cases of bladder cancer.

Alone, neither surgery nor radiation nor electrocoagulation is best adapted to every case. It is necessary to individualize; in some cases to use one method, in some another, and in many

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*Read in Section on Radiology, Southern Medical Association, Twenty-Sixth Annual Meeting, Birmingham, Alabama, November 15-18, 1932.

*This series of cases from the Howard A. Kelly Hospital was treated by Howard A. Kelly, William Neill, George Walker, and the author.

to combine two or all three of these methods of treatment. If the doctor conducting the treatment is very proficient in one method, but knows little of the other two, it is wisest for him to stick to the procedure which he knows; and indeed, in reviewing recent literature, I find that this is common practice.

The irritant which gives rise to the reaction of which this paper is the result, is a frequent statement in recent literature that neither radium nor x-ray has any place in the therapy of bladder cancer; that they do not cure, and that they often increase distress already well-nigh intolerable. Needless to say, this belief is not generally held; but it is in the hope of reaching those who have had such unfortunate experiences, and also to reassure those considering the employment of methods of radiation, that this paper is presented. It seems to the author that the proper use of radium and x-ray is indispensable in treating bladder cancers; that they are capable of producing permanent cures in the early cases, and in the advanced stages of relieving pain and distress, and perhaps prolonging life.

Involvement of the bladder by cancer originating outside the bladder is common in both men and women. In men, the prostate is the most frequent place of primary development, and in women the cervix and vagina. The treatment of these secondary tumors, as well as the prognosis, is quite different from that of the primary bladder cancers.

Kinds of Bladder Tumors.—Sarcomas, as well as benign connective tissue tumors, are quite rare. There are benign adenomas and cysts, but the great majority, perhaps 95 per cent of all bladder tumors, are papillary new growths. Some of these are non-malignant in the sense that they remain stationary for long periods of time; that they are attached to the bladder wall by a distinct pedicle, and that histologically they do not present malignant characteristics. These epithelial tumors, universally classified as benign papillomas, have a marked tendency to implant themselves over the bladder surface, although they do not metastasize. Such growths are usually treated by cystoscopic fulguration alone, or by fulguration and the intravesical application of radium. Primary cure is the rule, and recurrence, if it takes place, can be treated as the primary growth. As a matter of fact, such tumors show a marked tendency to recur, and it is necessary to keep the patient under observation over long periods to insure cures. The existence of a pedicle is not an assurance that malignancy may not be present, nor is the absence of the pedicle conclusive evidence that the condition is malignant. Actual infiltration and ulceration of the bladder wall usually does mean that there is cancer.

More than 90 per cent of all the sessile and infiltrating epithelial new growths of the bladder are malignant, and should be classified as papillary bladder cancers. In addition to these papillary growths, flat infiltrating squamous cell and adenocarcinomas are met with in about 3 per cent of all cases.

Occurrence.—The epithelial malignant tumors may occur at any age, but are far commoner in the decades after fifty years of age. The youngest patient in the series here reported was thirty-three years old, and the oldest ninety. The disease is from four to five times as frequent in men as in women, although, in our own material, females have predominated.

More than 70 per cent of all cases originate in the trigonal region of the bladder. The urethral and ureteral orifices are especially frequent sites.

Course.—While, as with cancer in all situations, there are great variations in the rate of growth in different cases, and while histological study of material removed by radical surgery or by biopsy shows every grade of malignancies, nevertheless, as compared with many other cancers, these tumors are all relatively benign in the sense that they grow slowly and metastasize later and in a smaller percentage of cases. It is likely that if death did not intervene from ureteral involvement or from sepsis, most of them would ultimately metastasize.

Symptoms.—In the early stages the symptoms are not striking. Hematuria is the most frequent initial symptom; it is frequently only slight. In the late stages the picture may be dominated by dysuria, uremia, obstructions, and by pressure pains due to extensions to nerve trunks.

Diagnosis.—The diagnosis rests on a cystoscopic examination and, in some cases, cannot be made without biopsy. As a rule, in infiltrating flat tumors, it is impossible to determine the extent of the growth by cystoscopy alone. A very large cancer may present only a small surface in the bladder. It is possible, however, to determine the presence or absence of a pedicle, of infection and ulceration.

It is much easier to determine by bimanual palpation under gas, or some other anesthetic,

the extent of the trouble in females than in males. In the latter this can often be determined only by an exploratory operation. By bimanual palpation, in patients that are not too fat, involvement of the regional glands can be detected, and it can usually be determined whether the growth has extended extravesically and become fixed or not.

Tissue Diagnosis.—From the viewpoint of treatment the gross appearance and extent of the disease is much more important than the histological classification and grading of malignancy. For this reason many authorities advocate that no biopsy should be made, and indeed, where a water cystoscopy is employed and the tissue removed by rongeur forceps, the likelihood of transplanting would make this procedure somewhat questionable. However, with the air cystoscope, and with immediate electrocoagulation of the regions from which the biopsy is taken, there would seem to be, in the light of our experience, very little danger either of implantation or of hemorrhage. Obviously, biopsy is not feasible where the tumor is entirely submucous. The advantages of biopsy, where radiation or electrocoagulation is employed, are that it furnishes an absolute diagnosis and, furthermore, makes possible a more detailed study of methods and results as applied to different types and grades of malignancy.

Conditions Suitable for Radical Operative Treatment.—All cases which have extended beyond the bladder, and which are fixed, or which show gland masses, are inoperable. Cases in which the tumor occupies the anterior or superior wall of the bladder, and where a suprapubic, extraperitoneal removal may be carried out, can be safely operated upon. Where the disease is not extensive, but situated in the trigonal region, conditions are much more unfavorable. Effectually to remove such tumors, a transperitoneal operation is necessary. It is a more dangerous route; the care of the ureter or urethra, and the complication of infection render the chance of cure and the operative mortality more unfavorable. Very extensive bladder involvement, without inoperable extravesical extensions, is rare, and would demand a complete removal of the bladder. It is doubtful that this operation is ever justifiable, and it should certainly be employed only after all other methods have proved futile, and where the age of the patient, as well as his condition, warrants the likelihood of survival. There are no available statistics as to the permanency of cure by this procedure. The primary mortality is very high.

Conditions Suitable for Electrocoagulation.—Small, pedunculated growths, if non-infiltrating, may well be treated by the transurethral route. In localized growths, which are infiltrating but not fixed, suprapubic incision is the method which should be employed in both men and women. Electrocoagulation is a valuable method of stopping intractable bleeding, even in the advanced, fixed cases.

Conditions Suitable for Radiation.—Any bladder tumor can be treated by radiation. In the very extensive, fixed cases, the treatment should be by external radiation with radium or deep x-ray alone. In some instances, implantation of radium needles, or screened radon seeds, is an additional method of value. Localized growths, which are not fixed, are best treated by combination of external teleradium* or x-ray, along with intravesical applications of radium by means of the cystoscope, and by implantation of radium needles or radon seeds directly into the growth. It is necessary, in all the small growths destroyed by transurethral electrocoagulation, to add thorough intravesical radium treatment by means of the cystoscope.

The employment of intrarectal radium is of limited value, as any considerable dosage will produce serious bowel injury. In the female, when the growth is in the base of the bladder, intravaginal employment of radium affords a safe and valuable method of treatment.

The intravesical cystoscopic radiation is unsuitable for cases with a bladder capacity of less than 70 c. c., and it is not applicable where persistent hemorrhage is taking place.

It is rarely necessary or desirable, in the female, to make a suprapubic incision, which is indispensable in the male when a thorough implantation technique is carried out. In women this can be done equally effectually through a Kelly cystoscope, or, in large masses, especially the fixed masses, directly through the vaginal walls.

Technic.—The same general principles of radiation should govern as in treatment elsewhere for cancer. It should be clearly recognized that it is not possible to eradicate cancer distributed throughout the entire pelvis; the aim should be thoroughly to treat the disease, to give as little treatment to surrounding structures as possible, and not to give treatment which upsets the patient's general resistance or the blood-forming

*The term "teleradium" applies to the use of radium in specially constructed apparatuses to limit the beam. The radium is employed only in focal skin distances of from 5 to 15 cm.

organs. It is not only possible, but desirable, on account of the general slowness of these growths, to treat by repeated dosage over some weeks. Very intensive single dose treatments should be limited to the small and well circumscribed tumors.

Teleradium and Deep X-Ray.—It is not my purpose, in this paper, to discuss the merits of teleradiation as compared to deep x-ray. It is true that during the period between 1910 and 1927 most of the patients whom we treated were treated by teleradium. It is my opinion that in proportion to the amount of radiation absorbed there is not a great difference between the two agents. For tumors situated in the base of the bladder, or in one wall, it is possible to give considerably greater radiation by radium than by x-ray. With the usual deep x-ray arrangement, and the choice of small fields, it is possible to give about one and a half, or at a maximum, two erythema doses. In order to do this, one must select suprapubic, sacral, and perineal portals. Employing radium, and using many portals, it is possible, but rarely desirable, to give as many as five erythema doses from the surface. The individual portals, in such a case, are not greater than 5 cm. in diameter, and can often be reduced to 3 cm. While the skin portal is of this dimension, the beam, when it reaches the base of the bladder, is three times as wide. Very much greater total dosage can be reached by employing methods such as those of Coutard or Pfahler. In no case, however, should dosage be given through a single portal sufficient to cause even a primary burn. The treatments should be given daily over a period of several weeks; and during the entire time, not only the general condition of the patient, but local conditions, should be kept under observation.

Intravesical Cystoscopic Radium.—Intravesical radiation should be made accurately, with the aid of a cystoscope. Young[1] has devised a most satisfactory cystoscope for this purpose. Until we had this instrument, we treated our patients through an air cystoscope, and the radium was held in place by a nurse. Our screening for intravesical radium is 3 mm. of brass. Great care should be taken that the cystoscope does not come in contact with the bladder wall. In order to distribute the radiation in large growths, the tumor is divided into sections. As a rule, the radium is kept at least 2 cm. from the actual tumor. If this is done it is possible to give as much as 2 gram hours radiation without undue vesical reaction. This is figured on dosage given within two or three days. In our very early cases, we learned that it was impossible to place radium directly in the bladder, as we would in a cervical cancer. It is occasionally desirable, in the male, where there is a contracted bladder, to do a suprapubic incision, and if most of the bladder is found involved, to place a single point of radium tube in its center, surround the tube in every direction with gauze, and give treatment so as to expose every part of the bladder. The amount of treatment will depend on the size of the bladder and the distance of the wall from the radium. One can be governed by the same principles as in radiating skin cancers.

Implantation.—The chief field for implantation is in the larger infiltrating vesical and extravesical masses. I would advise that the same general principles be followed as in radiation of mouth and tongue cancers. We have personally employed permanent seeds. These should be screened with at least 0.3 mm. of gold. The advantage of short concentrated seeds is the comparative ease in distribution and the resultant homogeneousness of radiation. Where the growth is localized, but the bladder contracted, it is sometimes desirable to put in removable seeds, and during the radiation to keep the uninvolved parts of the bladder separated from the implanted tumor.

In general, it is my feeling that it is wiser to implant fewer and stronger radon tubes than is generally advised, employing inches instead of centimeters as unit volumes. This, of course, is for large tumors, and for those more or less globular in shape. Where implantation alone is resorted to, this may be about 14 mc. to the cubic inch. Where intravesical radiation and cross firing are used in conjunction with implantation, the dosage can be proportionally considerably decreased. There is very much less necrosis from the implantation of one 16 mc. point than sixteen 1 mc. points, and yet the effectual radiation to the most distant parts of the growth are not very different. After the development of the gold and platinum screening for radon seeds, or, as we call them, points, we abandoned the employment of bare glass tubes for permanent implantation. Only in the last year of the series of cases which I am reporting, however, were the patients treated with anything but bare tubes. As a matter of fact, for moderate localized growths, the method was very effectual. Its chief objectionable feature was the slow-healing residual burn; also it was found that extensive implantations in extensive cases were

actually dangerous. Practically all the deaths which we observed, and could ascribe to the treatment, were due to this technic. In two very extensive cases, where death was due to pyelonephritis and sloughing ulcers of the bladder, autopsy examinations showed that all growth had disappeared. It is very important not to overtreat. Where there is a large extravesical growth and only a small surface of it is present in the bladder, the implantation should not be through a suprapubic opening into the bladder, but through this opening into the tumor outside of the bladder. It is manifestly impossible to cover all contingencies.

Planning Treatment.—After determining that a cancer is present, and after ascertaining its size, shape, position in the bladder, relationship to other parts of the bladder when distended, and distances from various surfaces of the body, a correlative treatment should be carried out, the general dosage aimed at determined, and the methods of obtaining this worked out. It should be remembered in this connection that the destructive effects of radiation and electrocoagulation, when these two agents are used together, is much greater than when either one is employed separately.

CONSIDERATION OF RESULTS OF TREATMENT

It does not fall within the scope of this paper to discuss the technical details of surgical and electrocoagulation methods. Papers dealing with the surgical aspect of this question are those of Deaver and MacKinney,[2] Bumpus,[3] Lower,[4] Haines,[5] Wade;[6] with the electrocoagulation treatment Corbus,[7] Smith,[8] and Kretschmer;[9] with radiation Burnam and Neill,[10] Redewell,[11] Barringer,[12] Colston,[13] Pfahler,[14] Dean and Quimby.[15]

Between the period of 1910 and 1927 there were, in all, 209 cases referred to the Howard A. Kelly Hospital Clinic for treatment. Many of these cases were in the last stages of the disease. Most of them had had previous treatment by electrocoagulation. Many had had operation and were recurrent cases. Out of this entire list of 209 patients, 45 were well for periods of from five years to eighteen years. This duration of cure is the standard surgical cure period. It should be remembered, however, that cases may recur after five years, or even after ten years, although we have not a ten-year recurrence in our series. It will be seen that these results on bladder cancers compare very favorably with those observed in connection with the treatment of uterine cervix cancers. The radiological treatment of bladder cancers has apparently been greatly more developed in America than in Europe. In reviewing the entire cancer situation from the standpoint of ray therapy, Forssell, the eminent head of the Radiumhemmet at Stockholm, places bladder cancer among the hopeless conditions. In no field of cancer work does the importance of seeing cases early and treating them efficiently stand out more strikingly than in bladder tumors, and as a matter of fact, bladder tumors do give symptoms early, do grow slowly, and if a real campaign is made to have such patients come for treatment early the results should be greatly improved. This, I think, will be clear in the description which we will give of the several groups in which we have divided our cases, in order to evaluate the different methods of treatment according to stage of advancement of the disease.

To begin with, let it be said that after radiation certain bladder cancers can be improved and the patients can live well beyond the five-year period without being cured of their disease. All such cases we have classified as uncured, and when we speak of cures we mean that the patient is free of symptoms and nothing is demonstrable on examination for a period of five years from the time the treatment is concluded.

I have divided the patients into four separate groups: first, the palliative group, where the disease had extended so far, and the patient was so ill that no effort was made to treat beyond a mild dosage to relieve pain, stop bleeding, and to check, if possible, the growth. Almost all of these patients were treated by teleradiation alone. The second group and the third group are similar, except that the second group, which we have termed operable, consisted of cases in which the growth was situated in a movable part of the bladder, where resection was, or could have been, carried out through an extraperitoneal incision. The third group consisted of cases situated in the base of the bladder, where an extraperitoneal incision and frequently implantation of one or both ureters would have been required if surgical procedures had been resorted to. In all of these cases the tumor was limited to the bladder; in all the tumor was infiltrating; and in most of them a histological diagnosis of cancer was made. The fourth group, of inoperable cancers of the bladder, were similar to the palliative group. In all cases, not only the bladder but the extravesical tissues were involved, and in all, either by bimanual palpation and cystoscopic examination, or by surgical incision, the disease was found to be fixed. In all these cases, radiation was given

with the hope of curing the disease. Most of them had a combination of teleradiation, implantation and intravesical or intravaginal radiation. It might be mentioned in this connection that when we do intravaginal radiation we observe the same principles as to distribution and spacing as in intravesical treatment, and usually protect the rectum by heavy lead screens.

Palliative Cases.—Taking these cases up in the order given, we will first consider the palliative cases. There were no deaths in this group of 66 cases which could be attributed to the treatment. In 50 of these cases there was no demonstrable improvement; in 16 there was very pronounced improvement, as shown by the cessation of hemorrhage, the relief of pain, and the improvement in weight, color and general condition. In two instances patients going down hill very rapidly resumed their work and were comfortable for periods longer than a year. They all ultimately, however, died of the disease.

Operable Cases.—There were in all 24 of these cases; none was smaller than 3 cm. across; all were malignant. Thirteen of these cases were living and well for periods of five years and longer. In this group of 24 operable cases, 8 were treated by operation and radiation and 16 by radiation alone. Of the 8 cases treated by operation and radiation, 1 lived five years but had recurrence after three years; 1 had recurrence after one year; 1 died, apparently of old age, at the age of 86, two years after the treatment and without any symptoms of bladder trouble; 1 case, heavily implanted with bare points through a suprapubic incision, died as a result of the treatment; 4 are living and well for periods of five years and longer. This gives a five-year percentage of 50. Of the 16 cases treated by radiation methods alone, 9 are living and well for periods of more than five years, 56.2 per cent. Of the 7 cases classified as failures, 3, who cleared up completely, have been lost sight of and cannot, as yet, be traced; 1 died of angina pectoris; 1 died of recurrence; 1 died of metastases; 1 was drowned two years after treatment. These patients treated by radium, who survived for more than five years, had in 3 cases treatment through suprapubic incisions and in 6 cases transurethral treatment. In addition, nearly all of them had teleradium or x-ray treatment. Taking both those that were operated upon and radiated in this group, there were 13 cures in 24 cases, giving a cure rate of 54.1 per cent.

Relatively Inoperable.—This group was inoperable on account of the situation of the growth in the base of the bladder. Many of them were very extensive, but in all cases the disease was apparently limited to the bladder. There were, in all, 39 of these cases, of whom 26 have passed the five-year period, a cure rate of 66.6 per cent. In 5 of the 39 cases, the radiation was carried out through a suprapubic incision, and 3 of these have remained well, while 2 died of recurrence. Of the remaining 34, the treatment was by various combinations of radiation without any surgical incision. Twenty-three of this group of 34 have met our conditions of cure. Of the 11 cases classified as failures, 2 have been lost sight of; 8 died of recurrence and extension of the disease; 1 was never cured, but with repeated treatments is still living nine years later; and several of those dying from recurrence lived beyond the five-year period, but were never cured.

Inoperable Cases.—There were, in all, 80 of these cases; many of them were recurrent cases after a surgical operation. All were advanced and all had definite extravesical fixation. Only 6 of this group remained well for periods longer than five years; 1 of them had a recurrence after remaining well for seven years. I am appending a list of these cases and shall not discuss this particular case further at this moment. Of the remaining 74 cases, 27 were improved neither so far as growth was concerned nor symptomatically; 3 cases have been lost sight of and the results of treatment are not known; in 10 cases there was marked improvement, both in the subjective symptoms and objective findings. These patients lived after the treatment for periods ranging from one to seven years. In this group of improved cases, teleradium alone was used in 3; intravesical and teleradium in 2; intravesical and implantation in 3; implantation alone in 3; and all three methods in 1 case. In 6 cases, death could fairly be ascribed to the treatment; 5 of these had implantation of bare points through a suprapubic incision, and 1 through the Kelly cystoscope. In 5 cases, there was marked improvement symptomatically, but no change in the tumor. These patients lived from six months to two years. One was treated by teleradiation alone; 3 by intravesical treatment and teleradiation; and 1 by intravesical treatment and implantation as well as teleradiation. In 7 cases there was complete disappearance of the tumor mass, but no relief of symptoms and death within six months. Five of these deaths were in patients treated by heavy bare point implantations, and one by teleradium.

In this last case death was due to ureteral obstruction and uremia. In 13 cases there were disappearances of growth and relief of clinical symptoms; 2 for periods longer than one year, but shorter than five years. Two of these cases, 1 living four and a half and one nearly five years, were treated by teleradiation alone. Intravesical applications and teleradiation were employed in 2 cases; 1 of them remained well for three years and 1 well for two years. Teleradiation and implantation, 2 by suprapubic route and 3 by transurethral, was employed in 5 cases. Four were free of trouble for two years and 1 for four years. One case, treated by vaginal and intravesical exposures, was well for two years and has been lost sight of. Three cases were treated by teleradiation, implantation and intravesical treatment. One of these was quite well for a year and 2 of the three for three years.

The six inoperable cases, which have remained well for periods of longer than five years, seem interesting enough to report in a little detail.

Case 1.—A man, age 49, No. 900, was seen June 10, 1914.

Both his father and grandfather had died of cancer.

The patient had dysuria, frequency, a little pain, and some blood in the urine. He was a healthy looking man. Bimanual rectal-abdominal examination disclosed a hard mass in the base of the bladder, extending out on the left side to the pelvic wall. The prostate felt normal.

Cystoscopic examination showed practically the entire trigonum involved by a lobulated, submucous growth. No tissue was taken.

This patient was treated by external radiation with radium, using a pack and a distance of 2½ inches. He was given, in three doses, a total of 45 gram hours radiation. He began to improve almost immediately and was relieved of all of his discomforts. A physician by occupation, he is at the present time, eighteen years later, apparently quite well.

Case 2.—A man of 65, No. 2353, seen December 20, 1915, gave a family history negative for cancer.

His general health had been excellent. The principal symptoms were difficulty in voiding, blood in the urine, and some pain on voiding. Intravesical examination showed an extensive papillary tumor in the base of the bladder, with moderate fixation on either side. The growth extended up from the trigonal area, both on the anterior and the posterior wall.

This patient received, at a distance of 3 inches, a total of 40 gram hours radiation. As the result of this treatment, the patient remained quite well until 1931, when he developed prostatic hypertrophy. This condition was treated by prostatectomy, and the patient is now, at 82, living and apparently well.

Case 3.—A man of 60 was seen August 7, 1915. This patient's trouble apparently began with a papilloma in 1911. He had a little dysuria and somewhat frequent hematuria, but never had a competent examination until October, 1914. In January, 1915, a resection of nearly half the bladder was carried out, for what proved to be a papillary, infiltrating carcinoma. In the summer of 1915 there was an extensive recurrence.

This patient was given one mild intravesical treatment with a radium tube in a silver catheter. He then had a series of external teleradium treatments, amounting in all to 25 gram hours at a distance of 2¼ inches. He had some skin burn as the result of this treatment, which was given entirely suprapubically. This patient ceased having hematuria and discomfort and remained well for about seven years. He then had a severe recurrence, from which he died.

Case 4.—The fourth case, No. 10789, a woman, aged 44, seen February 8, 1923, stated that her father had died at 73 of cancer of the bladder. She herself had been well, except for a uterine fibroid which showed no evidence of malignancy, and was cured by radium treatment. The patient had had vesical symptoms for about a year and a half and had been treated with radium, but had steadily grown worse. The patient was in fairly good general condition, but was suffering intensely with pain in the pelvis, dysuria and hematuria. The whole anterior vaginal wall was a solid mass of infiltration, extending out to the pelvic wall.

This patient was treated by intravesical, vaginal and suprapubic radiation. The first treatment was a gram of radium 2¼ hours to the anterior wall of the vagina through the vagina. The intravesical treatment consisted of a gram 15 minutes, making a small exposure, on account of the contracted bladder which existed in this case. She was given 33 gram hours of teleradium at a distance of 4 inches, and in addition, a month later, deep x-ray through two portals, one front and one back. As the result of these treatments the cancer disappeared, but a vesico-vaginal fistula developed. This has never been closed, but the patient has remained in the very best of general health.

The extensive character of the lesion in this case resulted in a fistula very difficult to repair operatively. The patient has never been advised to have ureteral implantation, which might be done.

Case 5.—A man, aged 56, No. 14204, was seen February 3, 1925.

The general health had been excellent. A tumor of the bladder had been found six months previously and treated by fulguration. On cystoscopic examination there was a sprouting, infiltrating carcinoma on the anterior bladder wall about 3 cm. in diameter.

The patient was treated with deep x-ray and with a gram half hour's radiation. The growth apparently disappeared and the patient was symptom-free until September, 1925. The location of the growth, which had reappeared, indicated that a suprapubic removal might be possible. On making the incision, it was found that there was an extraperitoneal extension, stony hard, and extending out to the pelvic wall. In this case 15 mc. of bare emanation points were implanted into the tumor mass, without opening the bladder. Following this, intensive radiation was carried out with x-ray. As the result of these treatments the growth disappeared and has not recurred up to the present time.

Case 6.—A man of 47, No. 17602, was seen February

22, 1927. His family history was negative. The general health had been good.

In the summer of 1926, he began having urinary bleeding, a pain in the right leg, and very foul, purulent urine. The man had lost about 25 pounds in weight in two years and was suffering with multiple sclerosis, as shown by a neurological examination. There was, on rectal examination, a hard fixed mass occupying the bladder posterior to the prostate, which felt normal and which was fixed on the right side. Cystoscopic examination showed a large sloughing infiltrating tumor.

Treatments were begun here with deep x-ray exposure, front and back, and the patient was then given a series of three treatments, amounting to a gram hour intravesically, with the radium cystoscope. There was very marked improvement in symptoms. A month later the deep x-ray was repeated and the patient was given another gram hour's radiation. As the result of this treatment, the growth entirely disappeared and there has been no return of symptoms or evidence of recurrence in five years.

RESUME OF RESULTS

Among 24 operable cases, there were 13 cures, or 54.1 per cent.

There were 39 relatively inoperable cases, with 26 cures, or 66.6 per cent.

Eighty inoperable cases were treated, with 6 cures, or 7.5 per cent.

There were 66 palliative cases with no cures.

The total number of treated cases was 209 with 45 cures. The absolute cure rate is 21.05 per cent.

Of 209 cases, only 63 were operable, even when the most extensive operative procedure was considered: only 30.1 per cent were operable. It is surprising that this percentage of operability, even when taking in all the cases involving the trigonum, is so considerable. It is far greater than is met with in gastric or rectal cancers, and higher than the percentage in cervical cancers in most reports.

RELATIVE VALUE OF DIFFERENT METHODS OF RADIATION

The comparative value of teleradiation by radium or x-ray has already been touched on and need not be considered further.

While, among those adequately and systematically employing radium for topical applications, either by the cystoscope or by implantation, there is general agreement as to the value of these procedures in the treatment of bladder cancers, there is much greater uncertainty as to the value of teleradiation. So far as I know, no extensive series of operable cases has been treated by this method alone and, indeed, it does not seem entirely proper to adopt such a method on account of the likelihood of progress of the disease during the treatment. There are variations in ray sensitivity of bladder cancers, as in cancers elsewhere. Our own experience does not lead us to believe that this can be determined by examination of biopsy specimens with a degree of accuracy sufficient to give it practical value. None of our operable or relatively inoperable cases has been treated by teleradiation alone. However, in the inoperable group of 80 cases, where a real effort was made to cure, there have been five cases in which there has been complete disappearance by this method alone, and three of these have developed into five-year cures.

Our feeling at present is that the method is so valuable that it should be employed in conjunction with other methods of treatment, whether surgical, electrocoagulation, or radiation, in practically all instances. It is, of course, indispensable for palliation in the advanced cases and is not associated with the dangers of more aggressive methods. It would seem justifiable to begin the treatment of every patient by this method, and in this way it can gradually be evaluated and properly brought into the treatment arrangement. It would also give us a better idea of the frequency of ray sensitive tumors and the relationship of this sensitivity to histological structure.

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DISCUSSION (*Abstract*)

Dr. Edgar G. Ballenger, Atlanta, Ga.—The size of a bladder tumor cannot, at times, be estimated accu-

rately by viewing it through the cystoscope. The estimate can be much more exact if a ureteral catheter, with markings of given length, be placed along the side of the growth.

Air cystograms are of much value in estimating the size of large tumors. On account of the danger of air embolus, air cystograms should not be employed when a tumor is bleeding. In such a case skiodan should be used in making the cystogram.

Early diagnosis is, of course, desirable, but cannot be made if patients and physicians wait until the bleeding is so extensive that the urine is red like wine. Microscopic blood should always be regarded as a danger signal indicating a careful urologic study to find the source and cause. The early recognition of nearly all urologic affections permits their eradication or control by minor measures. Neglect of early symptoms, such as frequent urination, difficult urination, nocturnal urination, pyuria and hematuria often allows minor conditions to become major ones while malignant or tuberculous affections may become hopelessly incurable.

Dr. J. M. Martin, Dallas, Tex.—I shall confine my remarks to a consideration of the advantages of weak platinum radium needles in the treatment of malignant tumors of the bladder.

The early steel needles were not satisfactory because of the consequent necrosis, ulceration and discomfort. Radon seeds are a great improvement over the steel needles. They offer a higher degree of filtration and their use has been followed by a reduction in tissue necrosis and pain.

The weak platinum needles are not new, but they are not in general use in this country. Small amounts of radium element highly filtered were originally advocated by Regaud, whose technic was later modified by Cade. Cade claimed that 0.6 mg. of radium element in platinum needles 1.0 cm. in length, with walls 0.5 mm. thick, would, when implanted in squamous cell cancer for seven days, destroy 1 c. c. of cancer tissue per needle. Our experience with this technic has, in the main, substantiated these claims. The needles may be from one to several centimeters in length so long as the distribution of the radium (approximately 0.6 mg. per centimeter) remain constant and the thickness of the walls is not less than 0.5 mm. This amount of filtration screens out all but the gamma rays, thereby preventing tissue necrosis and ulceration. Healing is rapid and there is little or no pain and discomfort.

These small radium element platinum needles are too large to insert through a cystoscope. Therefore, suprapubic approach with good exposure of the growth is necessary. If the lesion is of moderate size the mass may be destroyed with electrocoagulation, after which platinum radium needles 1 cm. in length, containing 0.6 mg. of radium element, are planted 1 cm. apart around and well under the edges of the growth and allowed to remain seven days. Where the tumor mass is large, longer needles may be used. The bladder is packed with iodoform gauze with suprapubic drainage. Convalescence is usually undisturbed and healing takes place in from six weeks to two months, with little or no disturbance of bladder function.

One of my cases came to the hospital because of a severe hematuria of three months' duration. The bladder was opened by Dr. Ralph Smith. A rounded carcinoma about 2¼ inches in diameter was discovered near the vertex of the bladder. A section showed squamous cell carcinoma. Needles were planted around the growth for seven days. Healing was uneventful.

A comparison of the radiation value of platinum radium needles and radon seeds should be of interest. In the case just reported 18 needles were used containing a total of 16.64 mg. of radium element. The needle implants remained in the tissues for seven days, or 168 hours, with a total radium effect of 2795.52 mm. hours. Ten of the needles were 1.0 cm. and 8 were 2.0 cm. in length. There was a total of 26 cm. of needle employed. When seeds are used it is necessary to plant one seed in the center of each square cm. of the growth. In this case 26 radon seeds would have been employed. If one millicurie destroyed is equal to 133 mg. hours of radium element and a seed must contain 1.4 millicuries to destroy one c. c. of cancer tissue, then one radon seed destroyed would be the equivalent of 186.2 mg. hours of radium element. The radium element equivalent of 26 radon seeds would, therefore, equal 4841.2 mg. hours, or a dose in excess of the 26 platinum radium needles by 2045.68 mg. hours.

The better filtration and the smaller radium content of the platinum radium needles, together with their constant effect, probably explains why there are better results with less necrosis, ulceration, pain and discomfort following their use.

The radium treatment with us is supplemented by deep x-ray therapy. We have treated a number of cases by this method with satisfactory clinical results. We can only class as cured those who remain symptom-free for five or more years. Time and experience will tell whether or not this method has come to stay.

Dr. Burnam (closing).—There are certain general principles in connection with radiation which have to be adhered to in order to dose adequately, but the fractions of the dosage can be built up in a variety of ways.

I am sure that the technics which I employed in treating these bladder cancers do not represent the best possible technic, nor do I feel that this has been established at present.

ARTERIAL HYPERTENSION*

A STUDY OF 327 PATIENTS OBSERVED FOR FIVE TO TEN YEARS

By Lee Rice, M.D.,
San Antonio, Tex.

Arterial hypertension has been widely discussed and numerous reports have added various names and definitions. Authorities have asserted that very little is known about the disease, and that symptoms are being treated. Many drugs have been commended and used that have later been condemned or discarded. Recent graduates find themselves confused because they discover that essential hypertension does not always produce large hearts and that large hearts and sclerosis of the palpable vessels frequently do not induce arterial hypertension.

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*Read in Section on Medicine, Southern Medical Association, Twenty-Sixth Annual Meeting, Birmingham, Alabama, November 15-18, 1932.

Since the last two or three years of the ten to twenty years of the "blood pressure" life of many patients present certain terminal eye and kidney signs, these years have been set apart to make a group with malignant hypertension; and the impression has been created that high blood pressure is a dangerous and rapidly fatal disease. Several of the patients in this study were told more than ten years ago that they could not expect to live longer than two or three years. Authors have to consume much time with explanations and qualifications. A reasonable level that may be called hypertension has not been established, although a systolic pressure of 140 and a diastolic level of 90 have been adopted by many as the upper limits of normal. If almost any plan of treatment or even fifteen minutes of quiet relaxation will lower the systolic pressure 20 mm. of mercury during the first ten or fifteen years, these figures become significant. More than half of the large reported series fall within this small range of 20 mm. between 140 and 160.

Dr. Christian, of Harvard, has expounded a simple and workable plan for the diagnosis and treatment of nephritis; and Dr. Simonds, of Northwestern, has resolved the numerous classifications of nephritis into two main types. It seems possible to answer the disputed points concerning the diagnosis and treatment of arterial hypertension and to establish a simple and workable plan for the diagnosis and treatment of the disease. In this report no patient had a systolic pressure lower than 160, nor a diastolic pressure lower than 90 during the first year of observation. Only 89 had a systolic pressure at any time during the first year under 170, so that we must be talking about a definite group.

MATERIAL

Three hundred twenty-seven private office patients with arterial hypertension comprise the group. They were comfortably seated and a standard mercury manometer was used. I, personally, took the recorded pressures by auscultation and palpation and have invariably been checked by an assistant. There are neither nurses nor interns nor hospital records. All records have been made between the hours of 10:00 a. m. and 5:00 p. m. The examinations have been deliberate and the patients had been resting from 15 to 30 minutes in a comfortable and well ventilated reception room. Specimens of urine, phenolsulphonephthalein output and blood chemistry have been studied often enough to give a clinician adequate information concerning the progress of the patient. The size and shape of the heart and aorta were determined roentgenologically during the first days of observation and at intervals of two to three months thereafter. Nitrites were not used during this period. The thiocyanates produced reactions which caused us to discard them in 1928. Extract of watermelon seeds and bismuth subnitrate were tried for periods of one year each with no observable clinical benefit. The iodides have been exhibited throughout the period of observation.

There were 196 females whose average age was 56.3 years, the youngest being 26 and the oldest 81 at the first examination.

There were 131 males whose average age was 55.8 years, the youngest being 22 and the oldest 79 at the first examination, so that 5 years may be added to these averages. Thirty, or 9.2 per cent, have died, seven from unrelated diseases (*Table 1*). About twice as many women as men have arterial hypertension and about twice

Table 1

CAUSES OF DEATH

No.	Sex	Age	Cause of Death
1	M	67	Chronic nephritis
2	M	70	Gallbladder disease
3	M	46	Fractured pelvis
4	F	62	Cerebral hemorrhage
5	M	59	Coronary thrombosis.
6	M	46	Cerebral hemorrhage, uremia
7	F	60	Cardiac failure
8	M	40	Coronary thrombosis
9	M	38	Cerebral hemorrhage
10	F	65	Malignant ovarian cyst
11	F	50	Carcinoma liver
12	M	59	Intestinal obstruction
13	M	65	Cerebral hemorrhage, uremia
14	M	57	Carcinoma pancreas
15	F	58	Unknown
16	M	54	Coronary thrombosis
17	F	74	Heart failure, nephritis
18	M	62	Nephritis
19	F	26	Nephritis
20	M	64	Cerebral hemorrhage
21	F	56	Cerebral hemorrhage
22	M	51	Heart failure
23	M	70	Bronchopneumonia, cardiac failure
24	M	58	Cardiorenal
25	F	29	Nephritis
26	M	69	Cerebral thrombosis
27	F	66	Automobile accident
28	M	71	Cardiorenal
29	M	56	Cardiorenal
30	M	59	Cardiorenal

Male 20. Female 10.

Seven deaths (2, 3, 10, 11, 12, 14 and 27) had no relation to blood pressure.

Hypertension was a result in 19 and 25.

as many men as women die from the disease and its complications.

The beginnings of all hypertension must be due to arterial spasm whether it is produced by environmental stimulation, acute toxins, physiological disorders, or psychic disturbances, and a considerable number of people in every community will respond to these various stimuli more readily and more profoundly than the others. During the first five to ten years of these reactions the hypertension may be "temporary" and small injuries to the vascular system may, or do, disappear, but finally the majority follow their destinies and the repeated stresses, infections, the menopause, years of national depression and wider and wider oscillations of the hourly and daily changes in arterial tension finally produce widespread vascular changes that make certain a "persistent" hypertension. Any temporary hypertension may become persistent if any one of a hundred emotional, economic or physical stresses cannot be removed or relieved during the years, and I think an easy analysis of the individual with a single word or two that states the background which produces the hypertension would effectively remove the criticism that our "ignorance in the fields of blood pressure is profound." The etiology is more easily stated than that of many nervous disorders such as neurasthenia. One is dealing with a definite constitutional type and, as a general rule, the patients are clear mentally, honest, frank, and graciously accept sound advice. Of course the treatment will be variable and may be surgical for the removal of an infected gallbladder, or physical to free a twisted ovarian pedicle, or social to aid in correcting the disorders of a home, but that is intelligent treatment. Simple sedatives should be given at times to help the patient help himself, and it would seem to indicate a lack of proper study and understanding to treat the hypertension directly with nitrites or cyanates. Temporary hypertension is a symptom of a tense and intense nervous system and does not produce dizziness, flushing, neck ache, palpitation, insomnia nor indigestion, but is a minor symptom of the complex, and unless the physician can spare a few minutes to exercise his judgment, the sphygmomanometer should be set aside and the blood pressure disregarded.

After organic changes have occurred the pathology becomes definite and understandable. I believe we can agree that wear and tear pro-

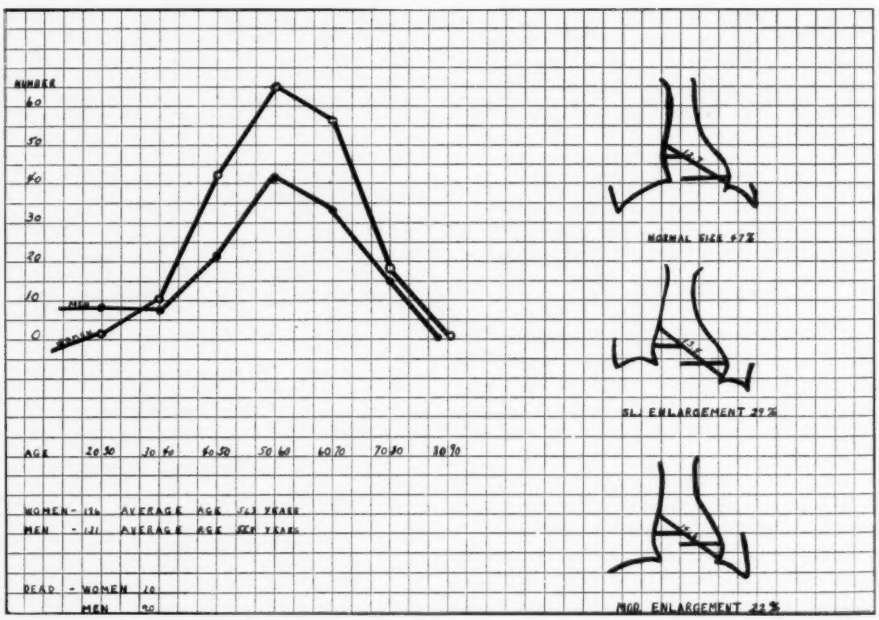

Chart 1

More women than men have persistent hypertension, and it is most commonly found between the ages of forty and sixty. All heart outlines, in this and the following charts, were drawn to the same scale.

duce arteriosclerosis and that the hypertensive individual suffers as much wear and tear during a year as the average calm man would suffer in two. Some of them shoot as many shocks through their bodies during a week as I do during the entire year, and certain organs must, in the very nature of our lives, suffer more than others, due in part to organ deficiencies, hereditary tendencies, previous infections, and hard work or exposure. Then obesity, diabetes, hepatitis, drunkenness and excessive smoking begin to play a part and add to the overload, but they cannot be thought of as causes, since it may easily be proved that any one of these produces low blood pressure. Hyperthyroidism, lead poisoning, or acute nephritis may produce fixed and incurable pathological changes within a year that ordinarily would not be manifest for twenty years, and the slower process certainly gives the patient a better chance to adjust himself to his changing, although progressive, pathology. If the kidneys fail rapidly after the first symptoms appear and the patient consults a physician only two years before his death, although he may have had a persistent hypertension and nephritis for years, he is likely to have uremia, eye signs, and mental symptoms. One may call this syndrome "malignant hypertension," but actually it is the same old picture that our forebears knew well, and represents the terminal years of an undisciplined life plus some infection or injury that damaged the kidneys and liver so that they could not stand the strain.

It seems to be acceptable that the constant, and usually the first lesion of arterial hypertension is a sclerosis of the arterioles and that the difference is only one of degree whether the disease be early, malignant or hypertensive without hypertension. The kidneys may show the principal involvement, but the essential lesion is widespread and very soon the larger vessels will show some sclerosis. It also seems to have been proved that stiffening of the large vessels only, primarily affects the systolic pressure and that sclerosis of the small vessels permanently increases the diastolic pressure. The heart must enlarge although the hypertrophy, during the first few years, is principally physiological, and finally the aorta widens and becomes sclerosed.

If the patient lives, as most of them do, and becomes adjusted to these changed and changing conditions, and if we admit that the organic lesion be present which, if once established, is incurable and permanent, how is it possible to disagree concerning treatment? By so doing we

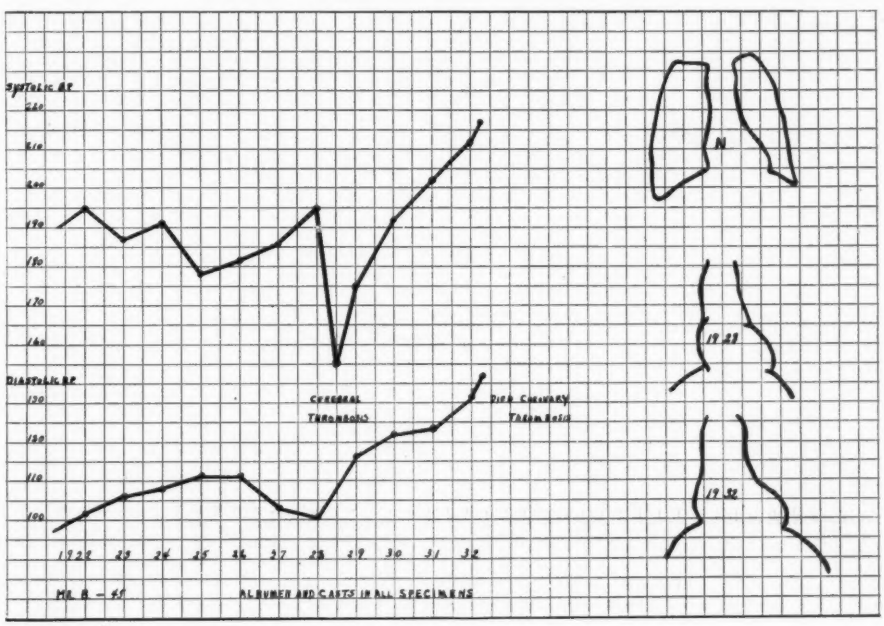

Chart 2

Hypertension with an early kidney lesion usually ends with a vascular accident, and the heart steadily enlarges.

confound ourselves and seriously disturb the patient. How can one presume or dare to throw the balance out of adjustment and interfere with kidneys which are already failing by giving nitrites or extract of watermelon seed except at times of brief emotional stress such as a death in the family or the trial of a law suit where relaxation, outdoor exercise, warm baths and quiet sleep may be impossible? Then the exhibition of such drugs for a few days to lower blood pressure may counter the effects of the added stress to prevent overshooting and may be of considerable value, but they cannot help the basic process, and, in my opinion, should not be used in treatment. Bismuth subnitrate seems to have no value clinically and is illogical, but it probably does no harm, gives the patient something to take, and may help those who have undiscovered amebae in the colon. If we add ½ grain of phenobarbital to each capsule without thinking aloud, the benefit is more than psychic. If pink water or small doses of dilute hydrochloric acid will lower the blood pressure and cause the patient to feel better, why should less simple drugs than these and the mild sedatives ever be ordered? I use sodium and potassium iodide in small doses for brief periods of not more than two weeks and when combined with a good menstrum they could do no harm. The clinical benefit during a long period of observation seems to be observable.

The preceding paragraph probably covers the field of medication and the future offers little more. But there is much that can be done without the use of drugs. All of these patients have a bad psychological condition that requires weekly correction. The great majority eats too fast and too much. They work too hard or play too hard or drink too much. They can often be taught to sit and fish, or to hunt fairly well, although they usually flush game so far ahead of them that it is not even seen. One cold, clear morning last fall when the brush was snappy dry, a deliberate hunter saw seventeen deer within range and did not take a shot, while four of his hypertensive friends hunting over as good or better range failed to see a single deer. A man with persistent hypertension who can learn to stop thinking or praying for an hour after lunch, and can prop his feet above his head, smoke a pipe and doze will arrest the progress of his hypertension. To arrest the disease is all that we can hope to do, and if the average age when

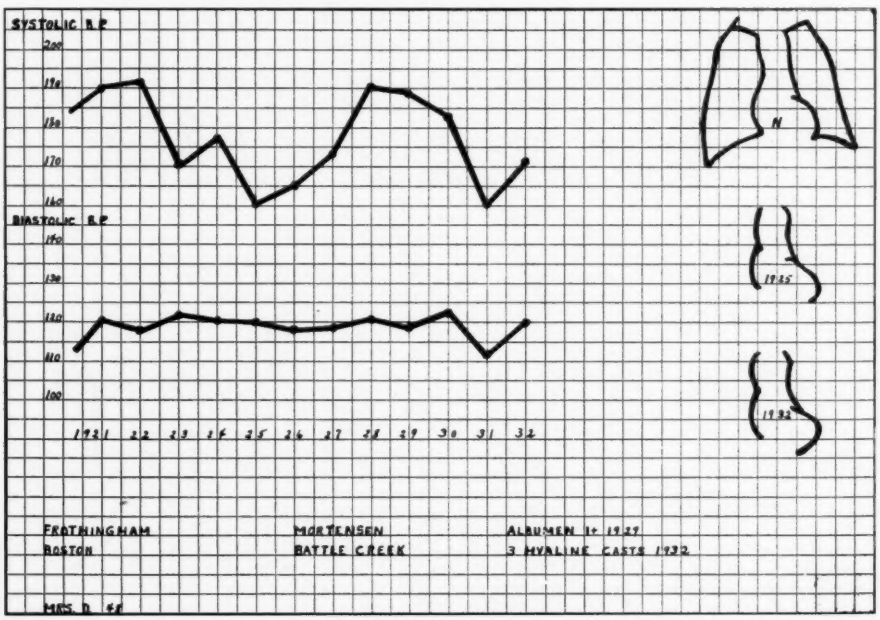

Chart 3

With no infections and good kidneys a persistent hypertension may follow a high level for years, and the slight cardiac hypertrophy be largely physiological.

it is first observed be near the normal span of 58 with ten years of the happiest period of his life ahead of him, provided he can be taught carefully to discipline his thoughts and daily life, we should be content, happily agree to handle arterial hypertension and give up the search for a specific drug so that harmful medication may be curtailed. We can busy ourselves with the correction of obesity, try to treat the glandular deficiencies, thoughtfully remove known foci of infection, occasionally massage the neglected prostate, guard them against a number of other diseases that this group of patients may develop as well as the man on the street who does not have the opportunities to consult a physician regularly, discover cancer, diabetes, glaucoma, duodenal ulcer, and many other disorders months or even years before they would otherwise be found. In this way in such a small series as the one reported here high blood pressure may actually be used as a cause for the prolongation of life beyond the reasonable expectancy.

SUMMARY

The etiological factors in arterial hypertension are not too obscure and the determination of them is not too difficult. Treatment is simple, well understood, and satisfactory. The average age of this group of 327 is now 61 years, and only thirty have died. This would seem to indicate that high blood pressure is not a serious disease if each patient can be given individual care, and if the patient will cooperate well. I also believe that regular observation enables one to discover many other diseases such as cancer, enlarging prostates and cholecystitis early enough to relieve or cure the patient so that life may actually be prolonged beyond the normal span.

It is suggested that the simple words "temporary" and "persistent," when properly qualified, will cover the entire field in this disease, and that the word "malignant" is misleading to many. That word has frequently been given to a terminal condition with widespread pathology which, itself, may cause the hypertension, and the pressure may be nothing more than the small measurable part of the whole. Since very few have the same conception of essential hypertension and its definite pathology, one might infer that disagreement lies in many names rather than the disease.

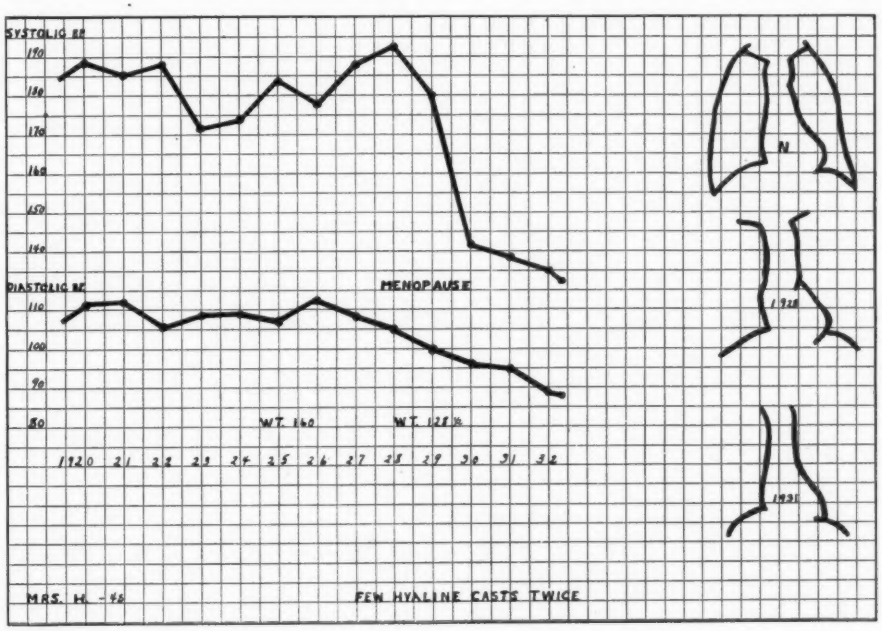

Chart 4

Some people with a definite arterial hypertension do recover. The last examination in December, 1932, revealed a systolic pressure of 124, and the heart outline was normal.

The prognosis of temporary hypertension is favorable, and in persistent hypertension it is better than in most of the other incurable diseases.

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DISCUSSION (*Abstract*)

Dr. H. G. Rudner, Memphis, Tenn.—Essential hypertension or hyperpiesia, from a clinical, therapeutic and prognostic standpoint, will have to be divided into two main classes for convenience, namely, the spastic types and the fixed types, or temporary and permanent, as the essayist suggested.

The spastic types are those associated with oral sepsis, syphilis, thyrotoxicosis, metallic poisons and emotionalisms. This type is not often associated with cardiac hypertrophy and myocardial disease. Neither is this type associated with extensive arteriosclerosis, nor is there a permanent diastolic hypertension.

The fixed types, fibrotic or arteriosclerotic types, present an associated cardiac hypertrophy with myocardial injury and other arteriosclerotic changes, plus persistent diastolic hypertension, and quite often an associated renal injury. It is in this type that we find that the prognosis is bad and the treatment does no good.

In the presence of marked arteriosclerosis the peripheral resistance as measured by the diastolic pressure cannot vary greatly, as it is fixed; whereas, with the functional spasticity of early vascular disease, the arterial tension is characteristically fluctuant and variable.

This information can be obtained in a very simple way. The soluble nitrites cause a rapid and marked relaxation of the arterial tone and a corresponding fall in blood pressure. This, of course, is transient and not permanent. Amyl nitrite pearls are convenient to use for this test. The vascular dilatation and drop in blood pressure does not occur, or is very slight in patients with extensive arteriosclerosis.

After the arterial tension has been taken, the patient inhales in broken pearls 5 minims of amyl nitrite. He becomes immediately flushed, perspires and may complain of vertigo. At this time the arterial tension is again determined and should be checked two or three times.

There is no danger in the test. The response is of great diagnostic moment and will give us a lead to further therapy. This is the method that Dr. E. J. Stieglitz, of Chicago, advocates in his book on arterial disease, and it is he who offered this classification. It is found that in the early cases the diastolic pressure will fall below normal levels, whereas, in late cases associated with arteriosclerosis, there is very little drop or none at all.

Dr. Rice (*closing*).—All of these patients were private cases. A larger group, including ward and outpatients in a large hospital, would show a much higher death rate. Good food, freedom from worry, and the means to take care of one's self certainly reflect in the death rate.

SOME CLINICAL ASPECTS OF CORNEAL MICROSCOPY*

By KATE SAVAGE ZERFOSS, M.D.,
Nashville, Tenn.

With the introduction of the slit lamp method of illuminating and the corneal microscope a greater appreciation and understanding of the anatomy and pathology of the cornea is made possible.

An advantage is secured if all other methods of examination have preceded the use of this instrument. Before proceeding with the customary use of it, the cornea may be observed with oblique focal illumination, using the instrument as an ordinary dissecting microscope. This method of study has been found to be especially useful in making a more gross observation of the lesions and in plotting them. An additional advantage is obtained in making a survey for recording the general distribution and localization of lesions by moving the slit lamp in such a manner as to have the beam of light sweep the cornea in its entirety.

The types of illumination given by Koby are as follows:

(1) Direct, which is self-explanatory.

(2) Transillumination, in which the reflecting screens are as a rule the iris and lens. If the latter is opaque its function in this respect is increased. The color of the iris often changes the tint and color of the objects observed. Transillumination is of less value if the overlying structures have diminished translucency.

(3) Indirect, which is intermediate between direct and transillumination.

(4) Zones of specular reflections or "a zone of discontinuity," the special use of which is in the study of the epithelium and endothelium.

The unit of observation is the corneal parallelopiped or prism, the essential divisions of which are:

(1) Anterior band.
(2) Posterior band.
(3) Optical section.

The anterior band incorporates the epithelial surface of the cornea, while the posterior band includes the endothelial surface. In the latter

*Read in Section on Ophthalmology and Otolaryngology, Southern Medical Association, Twenty-Sixth Annual Meeting, Birmingham, Alabama, November 15-18, 1932.

the cells appear hexagonal. In the human the nucleus is not visible, the cells showing a mosaic or honeycombed arrangement. The nerves of the cornea are described as fine threads of white cotton branching dichotomously at an angle ranging from 30 to 60 degrees. These are given by Koeppe as 30 in number, extending radially into the stroma in the middle or anterior two-thirds. Each nerve is believed to remain in the same plane of the corneal parenchyma. Except in a state of pathology the membranes of Bowman and Descemet are not visible. The palisade zone as given by Koby is a transition or gradual merging of the cornea and sclera. The latter tissue is extended on the cornea in fibrous radiations of varying length and width. The vessels of the corneoscleral region anatomose in arcades. The cornea is from 0.5 to 0.8 mm. in thickness, the central portion being thinner than at the periphery. These are the measurements as given by Butler.

Passing from the above anatomical references, we shall next consider the cornea in some of its pathological phases. Coupled with the slit lamp corneal microscopic observations one must know and visualize the anatomy and pathology, both gross and microscopic. The knowledge of the one augments the other and aids in the interpretation.

Ernst Fuchs, in his article, "Localization of Pathological Changes in the Cornea," has made the following three divisions:

(1) As to depth.
(2) As to surface extension.
(3) As to histology.

An additional angle from which we may direct our studies involves the character of the histological entities as the pigmentations, edema of cells, keratitic precipitations, vascularizations, and cicatrization.

One may observe pathological changes in the epithelium, Bowman's membrane, the stroma, Descemet's membrane and in the endothelium. In some conditions one or all or any combination of the structures may be involved. The cornea may become altered as a whole or in part due to increased or decreased thickness of the tissue. Areas thus involved may be multiple or single or generalized as in keratoconus. The increased thickness is caused by inflammatory deposits as cell invasion, edema and new tissue formation as in pannus. There may be an anterior or posterior hypertrophy of the cornea, depending on the site and depth of the lesion, or, as in the case of interstitial keratitis, it becomes generalized. In discoid keratitis the lesion is central. A decrease in the normal thickness of the cornea results from ulcers of traumatic, infectious or toxic origin. At one time in the process of ulceration and repair both increase and decrease in the depth of the cornea may take place. The decrease is generally noted at the time of the original ulceration and again at the stage of cicatrization.

The vascularization of the cornea resulting from pathological processes may be either superficial or deep in the parenchyma. Kreiker has observed that these loops or arcades of vessels eventually anastomose with each other. In a case to be shown, this anastomosis appeared to take place not only with the vessels situated in corresponding layers of the stroma, but in different planes. Friedenwald stresses the tendency of the capillaries to advance in the same place. As is well known, these vessels may become obliterated or may remain patent indefinitely. Corpuscles are often readily identified and the capillary circulation studied. This abnormal vascularization is more marked in such conditions as tuberculous and syphilitic keratitis.

The two membranes, Bowman's and Descemet's, tend to become folded in certain conditions, the latter being disturbed with greater frequency. The folding of these structures differs in that one is coarser than the other, having the translucency of folded cellophane. If the process begins centrally and radiates peripherally a coarse star is formed in the deeper membrane and a finer lined one in the more superficial membrane of Bowman. Conditions favoring an alteration of Descemet's membrane are (1) intra-ocular operations, (2) contusions, (3) conical corneas, (4) keratitis, (5) penetrating wounds, (6) birth injuries. The so-called striate keratitis is now considered by some to be vertical folds in the membrane radiating from the line of the corneal wound. These radiations may be vertical or oblique. Butler differentiates those of a permanent and those of a transitory type.

Other abnormalities of Descemet's membrane are, first, the tearing of the structure and endothelium, allowing it to float freely in the anterior chamber, and lastly the formation of Hassal-Henle warts or bodies. The structural change brings about uneven "embossing" or projections on the endothelial surface of the cornea believed to be existent in the adult cornea as a senile dystrophy. Vogt differs with Koeppe, who designates this condition as congenital pitting. Each individual lesion has been found to

vary from 0.07 to 0.008 mm. in size. They appear as holes in the endothelium, being rounded and dark, not hexagonal as is the cell boundary.

The keratitic precipitates on the endothelium are usually found in the lower half diffusely disposed over a triangular area. This distribution by no means holds as a fixed rule. The bearing of the circulation of the aqueous on this problem has frequent references in the literature. These precipitates are histologically composed of red and white blood cells, cells of adjacent fixed tissue and pigment of uveal and retinal origin.

Great interest is attached to the study of edema of the cornea, this additional pathological process being seen best by transillumination and in the zones of specular reflection.

When both endothelial and epithelial cells are edematous the characteristic ground glass appearance of the cornea is found. The epithelial cells appear irregularly elevated above the normal surface and so cause a loss of perfect light reflection. The endothelial bedewing or edema may be general or localized, is finer in its texture, more regular and later in uveal irritation shows islands of keratitic precipitates. Small areas of bedewing often precede the fibrin deposits and keratitic precipitates which Vogt considers a diagnostic index to uveal irritation. The bedewing of endothelium and epithelium may be coexistent or one may occur without the other's being involved. This condition is typically depicted in glaucoma.

The epithelial cells may become separated, causing the anterior band to bulge. These bullae may rupture and are often found in tuberculous keratitis. Individual or groups of cells may undergo liquefaction, which differs from the true bulla. In the latter the separation is over a greater extent than the actual bulla formation.

As to deposits in the parenchyma of the cornea, Koeppe's declaration that he can differentiate those in the lacunar and lamellar systems is denied by Koby. The latter lists the deposits commonly found as calcium, cholestrin, uric acid, urates and pigment granules. Kraupa has described calcareous deposits or infiltration of the cornea which are horse shoe in shape. The case shown is similar. The numerous granules were best shown by transillumination. Because of the proximity to the periphery of the cornea and the large amount of astigmatism it was impossible to focus the prism distinctly. Koby reports a case of this kind, but doubts whether or not the opacity was due to calcium. The lesion was central near Bowman's membrane.

There are several varieties of corneal involvement which illustrate some of the types of histological changes. The first is keratitis disciformis, which is located in the central portion of the cornea appearing as an opaque disc. Its occurrence usually follows a corneal injury such as that caused by a foreign body or other types of trauma. The stroma becomes infiltrated and opaque, bulging posteriorly with a small area of cornea uninvolved lying beneath the epithelium. The latter shows stippling. The cornea is increased in thickness at the site of involvement. Some of the endothelial cells peel off, leaving craters. The former regenerate and the prognosis is good. At no time is there vascularization.

Keratitis punctata superficialis is the second in this group. This is characterized by small white dot-like opacities of the epithelium, usually centrally placed and showing at times vacuolization.

Herpes is also superficial and is readily recognized by the peculiar outline of distribution. Small rice-like deposits are beneath Bowman's membrane. Later the ulcers appear.

Ectatic marginal degeneration shows an irregular opacity at the periphery, some vascularization and at first a gutter-like excavation. This is followed by ectasia and still later by a marked thinning of the cornea.

Keratitis profunda marginalis (sclerosing keratitis) is thought to be the result of chronic infection. The affected area is in the posterior half of the cornea extending from the periphery and is vascularized.

Arcus senilis appears entirely superficial, but is in reality a dystrophy which extends to the periphery in the deeper portions of the cornea. An area of uninvolved epithelium separates the more superficial portions from the corneoscleral margin.

Considering a more practical application of this method of examination, we find one of its greatest fields of usefulness in observing traumatic lesions. Following a contusion, pigment is often found on the endothelium of the cornea. Intracorneal hemorrhages are seldom seen. With intra-ocular copper a change in color in Descemet's membrane frequently occurs, the deepest tint being at the outer edge. The superficial loss of epithelium and stroma as in an abrasion, the presence of a foreign body, an infected or toxic ulcer and an early appearance

of herpes simplex are a few of the abnormalities promptly recognized. Especially in the industrial injuries is the corneal microscopic examination of importance. Not only is the original diagnosis made with greater exactness, but the progress of the case is followed with an added assurance of completeness.

The broad and narrow beams may be used augmented by fluorescein instillations to ascertain the depth, width, shape, absence or presence of infiltration and capillaries and later the process of repair with the formation of new epithelium.

A few considerations with reference to foreign bodies and their localization is of importance in this special method of study. Direct illumination is essential and the greatest accuracy in focusing the corneal prism is necessary. The location of the foreign body is roughly determined by its distance from the edge of the anterior band to that of the posterior band as it appears in the optical section. A more exact measurement is made by the use of the micrometer. The length of the shadow produced by the foreign body posterior to its true position aids in the appreciation of the relative location of the object according to Koby. This, of course, is not an exact procedure, but an aid of value. This author also calls attention to the fact that nebulae, vesicles, blood vessels, pigment, mucous and air bubbles may produce a kindred shadow and cause confusion. Obliquely embedded foreign bodies should be studied as to the course and angle taken, thus making the removal easier and less damaging to tissue.

One is indebted to Peter and to Graves for their comprehensive work on corneal endothelial dystrophy, the former recognizing three types, which are summarized as follows:

Changes resulting from:

(1) Uveal inflammation with the cell outlines altered in contour, surface uneven and pigment deposits. The condition may be unilateral or bilateral.

(2) Traumatic, showing again an uneven surface, edema, distinct hexagonal cellular outlines, localized at the site of injury with overlying epithelial impairment. Usually unilateral.

(3) True dystrophy located in the center of the cornea and extending toward the periphery, permanence of lesion which is bilateral.

A brief of this paper is given in the following list of characteristics:

(1) Areas rounded and of large size.

(2) Mosaic of cells not altered.

(3) Black and non-reflecting.

(4) Slight or no visual impairment early, followed by late impairment.

(5) Beaten silver appearance.

(6) Diminution of number of cells.

(7) No regeneration of cells.

(8) Average age incidence, 61 years.

Peter considers cases presenting the above picture as being poor operative risks because of a lowered vitality.

Of the various pigmentations of the cornea an indication of the essential elements of only a few will be given.

Kruckenberg's spindle has had many descriptions with some variation of detail. Rings of pigment, with and without a central dot-like deposit, are found on the posterior surface of the cornea, upon Descemet's membrane or in close proximity. The distribution on the center of the cornea is spindle-shaped with the greatest diameter at 90 degrees. The pigment is light brown in color. Edgerton gives the size of the spindle as varying from 2.5 x 1 mm. up to 4.5 x 3.5 mm. It is bilateral and symmetrical and thought to be congenital, although some difference of opinion exists as to its being found only in myopic cases. Edgerton reports cases of hyperopia which had the lesion under discussion. Kruckenberg states that the pigmentation occurs in the sixth week of embryonic life, at which time the iris and cornea were approximated.

Another distinct variety of pigmentation is described as Kayser-Fleischer's ring. The condition is found associated with hepato-lenticular degeneration. Granular deposits of brown pigment are observed at the periphery, fading in density and color on the inner margin. The outer margin is sharply defined. The entire circumference of the cornea is involved. The nodules are found in Descemet's membrane and adjacent to the endothelial cells. The width of the ring is from 1 to 1.5 mm. Fleischer's ring is often observed in cases of conical corneas.

A differentiation is made in the two types of wavy pigmented lines running horizontally across the cornea. Both are superficial. Hudson's brown line is seen in areas of cicatrization being easily observed by the grosser methods. In focusing the other type of pigmentation, Stahli's line, more difficulty is encountered due to its faintness. The pigment is near Bowman's membrane and varies in width.

The time does not permit more than a limited outline of a few classical diseases: parenchymatous keratitis, tuberculous keratitis and glaucoma. A brief of Butler's description of the es-

sential features from the corneal microscopic viewpoint is as follows:

1. SYPHILITIC PARENCHYMATOUS KERATITIS

(1) Nodular opacities in posterior portion of stroma.

(2) Pathological process extends anteriorly to the anterior third of the cornea.

(3) Clear and uninvolved stroma found below the epithelium.

(4) Vascularization:

(a) Early extension of capillaries in the deeper layers of the stroma.

(b) Later an arcade of vessels of conjunctival origin.

(c) Anastomosis of the two.

(5) Increased thickness of cornea.

(6) Radial folding of Descemet's membrane.

(7) Sclerosis of posterior surface of cornea.

(8) "Back of prism is more obvious than the front granular sheen. High reflections."

(9) Tendency to return to normal thickness and contour.

2. TUBERCULOUS KERATITIS

(1) Lesions in any level of the cornea, superficial or deep.

(2) Localized lesions.

(3) Entire cornea rarely involved.

(4) Superficial and deep vascularization begin at the same time.

(5) Less thickening of the cornea than in syphilitic keratitis.

(6) Marked variations in the thickness of the cornea, some areas being as little as one-fourth the normal and other areas increased.

3. GLAUCOMA

(1) Edema of superficial layers of the cornea.

(2) Vesicles beneath the epithelium.

(3) Rupturing of the vesicles and healing cause irregularities.

(4) Vascularization and new connective tissues between epithelium and Bowman's membrane.

(5) Pannus degeneration; hyalin and calcium deposits in a band across the interpalpebral space.

(6) Adhesion of iris and posterior surface of the cornea first by cohesion of cells, later by fibrous adhesions.

(7) Necrosis of corneal stroma due to capillary collapse.

In closing, a few of the advantages of corneal microscopy are listed:

(1) In recording lesions as to type, site, size, width and depth.

(2) In diagnosis and prognosis.

(3) In differentiation of new lesions and old ones which are adjacent or overlying and in determining whether an old pathological area is active or has received a new injury.

(4) Localization of foreign bodies.

(5) Removal of extremely minute particles from the cornea as in the use of the fluoroscope to augment perception.

(6) Rechecking the condition of the cornea after removal of the foreign body for stained cells and smaller particles.

(7) In fulfilling medicolegal responsibility.

(8) In preliminary examination prior to intra-ocular operations, observing the vitality of the cornea and the depth of the anterior chamber.

(9) Measurements of growths as epitheliomas and pterygiums as to the original size and diminution following therapy.

(10) In teaching ophthalmology.

(11) In the increased personal satisfaction of the observers in the study of their cases.

I have avoided reference to the description of the instruments and the exact technic of their use, stressing by preference some of the observations rather than the methods of obtaining them. I wish to express my appreciation for the cooperation of Mrs. Anna White Lipe, of Vanderbilt University, Department of Medical Illustrations, for her record of cases as we observed them as well as for the reproduction of the plates by Butler, Koby and Friedenwald. We regret that we cannot at this time also present the photographs made with the stereo-camera, the use of which is one of the advantages obtainable through recent developments.

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DISCUSSION (*Abstract*)

Dr. A. G. Wilde, Jackson, Miss.—There is probably no ophthalmologic instrument so closely associated with one name as is the slit lamp with that of Vogt of Zurich. Following the perfection of the corneal microscope by Czapski and Gullstrand's method of illumination, they were combined in their present slit lamp form, and Vogt devoted himself to learning what this new instrument would reveal. His atlas is the basis of most of our subsequent knowledge.

The acceptance of the slit lamp has not been general in this country on account of several factors. (1) Its price is inordinately high. When it can be delivered for one-quarter the present amount, its use will become greatly extended. (2) It is not necessary for routine use and is limited to examinations of the anterior segment. (3) Time is consumed in learning to use it. (4) Its value is largely dependent on the observer's knowledge of the microscopic pathology of the eye. Americans as a whole do not devote the same time and care to the study of pathology as Europeans, and naturally the latter have taken and held the lead in the use and interpretation of the slit lamp.

While my training in Europe was with the Zeiss, my preference is for the Bausch and Lomb instrument. For ordinary uses the hand slit lamp made by the same firm is quite satisfactory, as it is quickly adjusted, it costs little, and affords serviceable information as to the larger lesions. Its optic section of the cornea is definite; it has the pin-hole and varying degrees of illumination, with magnification by a loupe. I never employ the larger instrument without a preliminary review with the smaller, and it is only in the minority of cases that the larger is found necessary.

One of the uses of the slit lamp mentioned by Dr. Zerfoss is for the recognition of a pre-existing interstitial keratitis from observation of the partially obliterated blood vessels in the anterior third of the cornea. This evidence of cogenital lues is frequently an aid in determining the nature of subsequent abnormalities or visual disturbances.

The slit lamp is also an instrument unequaled for the early determination of sympathetic ophthalmia. Here the postlenticular space is seen to contain a collection of floating cells that give us the first intimation of what is pending. It is of interest to recall that since the advent of the slit lamp the existence of a hyaloid membrane enveloping the vitreous is seriously questioned. What we formerly accepted as a definite membrane seems rather a zone of condensation of vitreous substance.

In the normal cornea there are no visible vessels except at the limbus, but under the higher powers of magnification the limbus is limited to a definite point. Perhaps nowhere in ophthalmology is a long and careful study of normal eyes a more necessary preliminary than with the slit lamp. Here one's view is so changed that one is almost in a new world of observation, and the normal must first be clearly understood before one can recognize the variations therefrom which constitute the abnormal. Also congenital peculiarities and fetal remnants are seen so frequently that there is scarcely an eye in which they are not present in varying degrees. Their differentiation from actual pathological conditions is not always easy, and unless one can make this distinction the results of slit lamp study are greatly handicapped.

In the normal eye the aqueous contains a few floating cells that have a slow but orderly movement. In inflammation there occurs an outpouring of albuminous substance into the anterior chamber and all cell movement ceases. The normal clearness of the aqueous becomes lost; the additional cellular content causes what is referred to as "an increase of aqueous flare." This is the first sign of an inflammatory exudate involving the anterior segment and its recognition at this stage is possible before it is shown by the grosser methods of examination.

A use I have put the slit lamp to is to determine the presence and amount of pupillary reactions to light. The dark room, the small mobile source of intense illumination, and the coincident magnification render it particularly effective for this purpose. With it I have never seen an absolute Wernicke hemianopic pupillary reaction, even in absolute hemianopia. The normal optic density of the lens reflects a certain amount of light in all directions, in spite of its angle of incidence, and causes a discernible reaction of the pupil when the blind side of the retina is illuminated. Even when no light reaction can be detected grossly, slight worm-like movements of the pupillary margin can be frequently detected with the slit lamp.

To sum up, I do not regard this instrument as necessary for routine use, but rather reserve it for the obscure or the unusual, and especially for the increasing flood of accident cases in which future litigation is possible. Here our examinations and records cannot be too minute, and as we are becoming almost a nation of compensation seekers, the occasions for the use of the slit lamp are destined to be seen in increasing numbers. It is invaluable for determining the full extent of the lesion, and especially for excluding old or congenital defects.

I have noted in malingering, a fear of or resentment to slit lamp examinations, as the complainer is suspicious of just what this strange apparatus may reveal. He is prone to close his eyes, move them constantly or complain bitterly of the light even when it is not directed into the pupil. When this attitude is marked, a suspicion of an exaggeration of symptoms is usually justified.

Dr. Edward W. Griffey, Houston, Tex.—There is no method of examination that has been added to our mechanical equipment nor which to me affords a greater satisfaction than the use of the slit lamp. Certain corneal conditions are as impossible of diagnosis without this instrument as diagnosis of a specific type of infectious organism from a smear is impossible without the microscope.

I refer particularly to those minute lesions on the anterior and posterior corneal surfaces. Two examples that I happen to think of at present are the minute herpetiform lesions of the corneal epithelium and endothelial excrescences or "warts." Fine pigment dust deposits and cells in the aqueous and other early signs of iritis can best be shown by this means of illumination.

Differentiation of superficial or deep vascularization of the cornea can be studied and the blood vessels localized, which as we all know is an important diagnostic sign in corneal diseases.

It is the custom in our office to subject every patient to a slit lamp study as a routine procedure. Dr. Zerfoss has well described the occurrence of endothelial "warts" or dystrophy of the corneal endothelium which were recently discussed by Peters and others. We

have for the past two years kept accurate records on several hundred examinations of patients over twenty years of age, and find that dystrophy of the corneal endothelium occurs in an appreciable percentage of our cases. In a few they have been so dense near the optical center of the cornea that it is possible to observe the bedewing effect by oblique illumination with the loupe and lens. These may also be seen, though less readily, by means of the ophthalmoscope. Although seen much more commonly in patients past fifty, these "glints" do occur not infrequently in patients between the ages of 30 and 40. We have never seen this condition in a patient under thirty years of age. It would seem a safe conclusion that these dystrophic glints are senile or pre-senile retrogressive manifestations.

Likewise, and more important from a practical viewpoint, we should observe that their recognition and study has aided us in determining another cause of otherwise unexplained loss in visual acuity.

Dr. William Thornwall Davis, Washington, D. C.—I wish to mention a form of keratitis which I reported before the Academy in Montreal in September. One sees in the cornea with the slit lamp under high magnification from 2 or 3 to 15 or 20 small white angular specks accompanied by lines in this membrane. The presence of these white flecks is accompanied by the symptoms of an acute conjunctivitis, namely: lacrimation, photophobia, perhaps slight edema of the upper lid and the feeling that a foreign body is in the eye. These attacks occur at intervals and are apt to be mistaken for conjunctivitis. When treated as such the keratitis is aggravated. In 11 cases seen, 9 were due to dental or tonsillar infection. I have designated this form of keratitis as superficial punctate parenchymatous keratitis to distinguish it from the more common superficial punctate keratitis with which we are all familiar.

Dr. Ray K. Daily, Houston, Tex.—Slit lamp microscopy enables us to see in the living eye what we have heretofore seen only in the enucleated eye. To appreciate the deviations from the normal eye one must be familiar with the normal and this familiarity can only be acquired by the routine use of the slit lamp and corneal microscope. The occasional use of the instrument is valueless and may at times be embarrassing. Not being acquainted with the normal eye, one may become apprehensive about perfectly normal findings. I recall a case in which an ophthalmologist told a patient that she had a very serious eye disease, because he found with the corneal microscope a deposit of star-shaped pigment on the lens, which the use of the slit lamp has demonstrated to be quite a common congenital phenomenon of no significance.

Dr. F. H. Rosebrough, San Antonio, Tex.—I should like to emphasize the clinical value of the finding of pigment deposits upon the posterior surface of the cornea in the diagnosis of both iritis and all forms of primary glaucoma, especially in the inflammatory type in which large quantities of pigment can be seen.

Permit me to mention a case I saw several years ago, making a diagnosis of superficial keratitis, which healed promptly. Recently the patient appeared in the office of one of my colleagues with a corneal condition which was diagnosed by the use of the slit lamp as herpes corneae. It is quite possible that the slit lamp eventually may reveal a relationship between some of our cases of superficial keratitis and herpes corneae. Perhaps the former may sometimes be the forerunner of the latter.

PROGRESSIVE PSEUDOHYPERTROPHIC MUSCULAR DYSTROPHY*

By ALLEN F. VOSHELL, M.D.,
Baltimore, Md.

Although the diagnosis of progressive pseudohypertrophic muscular dystrophy has been made many times during the last one hundred years by practically all physicians, it is only recently that methods of treatment have been offered which hold out any promise of help for these pitiful cases. The use of epinephrine and pilocarpine was advised by Kure and Okinaka[1] in 1930; following them in this country, Garry de N. Hough, Jr.,[2] has reported the results of his treatment by this method in a group of patients. I have used Hough's paper as a primary reference as well as a stimulator and have followed his suggestions as submitted therein supplemented by direct correspondence. Only very recently has a second method of treatment been suggested, that is the ingestion of glycine by Milhorat *et al.*[3]

History.—Semmla, in 1834, and Costa and Gioja, in 1836, were the first to recognize and describe the syndrome now known as progressive muscular dystrophy, but Duchenne, in 1868, was the first one to describe the condition fully and to put a name to it, myosclerosis.

The hereditary feature was added in 1876 by Leydin and in 1879 by Mobius; the primary myopathies were differentiated from the atrophies of central origin by Erb in 1883, who also added the microscopic pathology of muscles, and a separate clinical type of this disease, the juvenile type which now bears his name; and the fascioscapulohumeral type was made a part of the group by Landouzy and Dejerine in 1884 and is titled by their name.

The frequency of the disease is not such as to permit any one person to see a very large number of cases within a few years, but no doubt every physician has seen one or more at some time during his medical career.

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*Chairman's Address, Section on Bone and Joint Surgery, Southern Medical Association, Twenty-Sixth Annual Meeting, Birmingham, Alabama, November 15-18, 1932.

Males predominate over females by a very large figure; in fact, in Hough's series of 28 cases no females were seen, and in my own experience of about 25 cases two white females were seen. So far as can be determined, only the white race is affected by the disease. The age of onset is between two and eight years, with the average at about four. The earlier the age of onset, the poorer the prognosis. Adults may rarely be affected.

The following five types of the disease are recognized:

(1) The Duchenne pseudohypertrophic type, which is the most common, lends its name to the whole group and emphasizes the enlargement of the calves of the legs.

(2) The shoulder girdle pseudohypertrophic type, which is less common, occurs more slowly and at a later age than No. 1.

(3) The Leyden-Mobius type is identical with No. 1 except for lack of the pseudohypertrophy of the calves.

(4) The fascioscapulohumeral type of Landouzy-Dejerine involves the face muscles early and later develops a progressive loss of strength in the shoulder girdle and arms. This type develops a typical "myopathic facies" characterized by an appearance of apathy, "frozen" forehead, flattening of the upper lip with some projection of it (so-called "tapir lip"), lag-ophthalmos, transverse smile, and loss of the power to whistle or pronounce labial letters.

(5) The juvenile form of Erb simulates No. 4, but has not the typical facies and develops later in life.

The above groups are not always entirely distinct, but at times tend to assume some of the characteristics of another type, although adhering mainly to one.

The etiology of the disease has never been determined. Three theories in general have been put forth; that the disease is due to disturbances in the mid-brain or central nervous system, secondarily affecting the muscles through the nerve channels; that it is due to primary pathological changes within the muscles themselves; and that abnormalities in the endocrine system are to blame.

Erb, in his original article in 1883, stated that he considered the primary lesion to be in a trophic center.

Many observers believed the change of the muscle tissue into fat to be the basic lesion, but this has now been pretty well eliminated.

Barker felt that abnormalities in the capsule of the suprarenals with insufficient secretion was responsible for the secondary change in the sarcoplasm of the muscle fibers. Others have blamed the pituitary, pineal, and thyroid glands, as well as a general internal glandular upset.

No one has been able to prove the effect of any one gland, although cases have been reported which certainly show some the effects of internal secretory changes.

Heredity.—The hereditary factor is certainly of importance in this disease, although many cases have no traceable antecedents who were similarly affected. It has been possible, however, in other cases to trace the disease back one or more generations, and in every case the transmission was through the females to the males, never directly. There may be more than one male child of the same generation affected. In one family in which I have traced cases back four generations, there are three children affected in the present generation; and here today I have three more sets of brothers affected (*Chart 1*). The hereditary influence has been responsible for investigations by many students, but with little definite progress. The most interesting study was made by Minkowski and Sidler on a family in a secluded Swiss valley where accurate records for three hundred years were available.

Two families, H. and R., each having cases of dystrophy on record, were investigated and it was noted that no cases had developed for many generations, but considerable intermarriage had been taking place. All of a sudden an outbreak of muscular dystrophy occurred. It was concluded that according to the Mendelian theory the hereditary features were of the recessive mode, and that cases of the disease could appear only from marriages between members of the two families, and that the rudiments of the disease must have been present in both parents, as it only appeared in children each of whose parents was derived from both the H. and R. strain by previous intermarriage. This rudimentary factor must have been present, but dormant, in both sides for over three hundred years and only awaited a reactivation by a fusion with a factor from the other family. All of the above cases were of the Duchenne pseudohypertrophic type.

Barker, on the other hand, has shown that the Landouzy-Dejerine type (that is, Type No. 5, the fascioscapulohumeral without the typical facies) follows the Mendelian law and is therefore a different disease from the Duchenne type, even though the clinical picture is similar.

Syphilis and other cerebrospinal diseases have been found in association with the dystrophy, but no definite responsibility has been attached

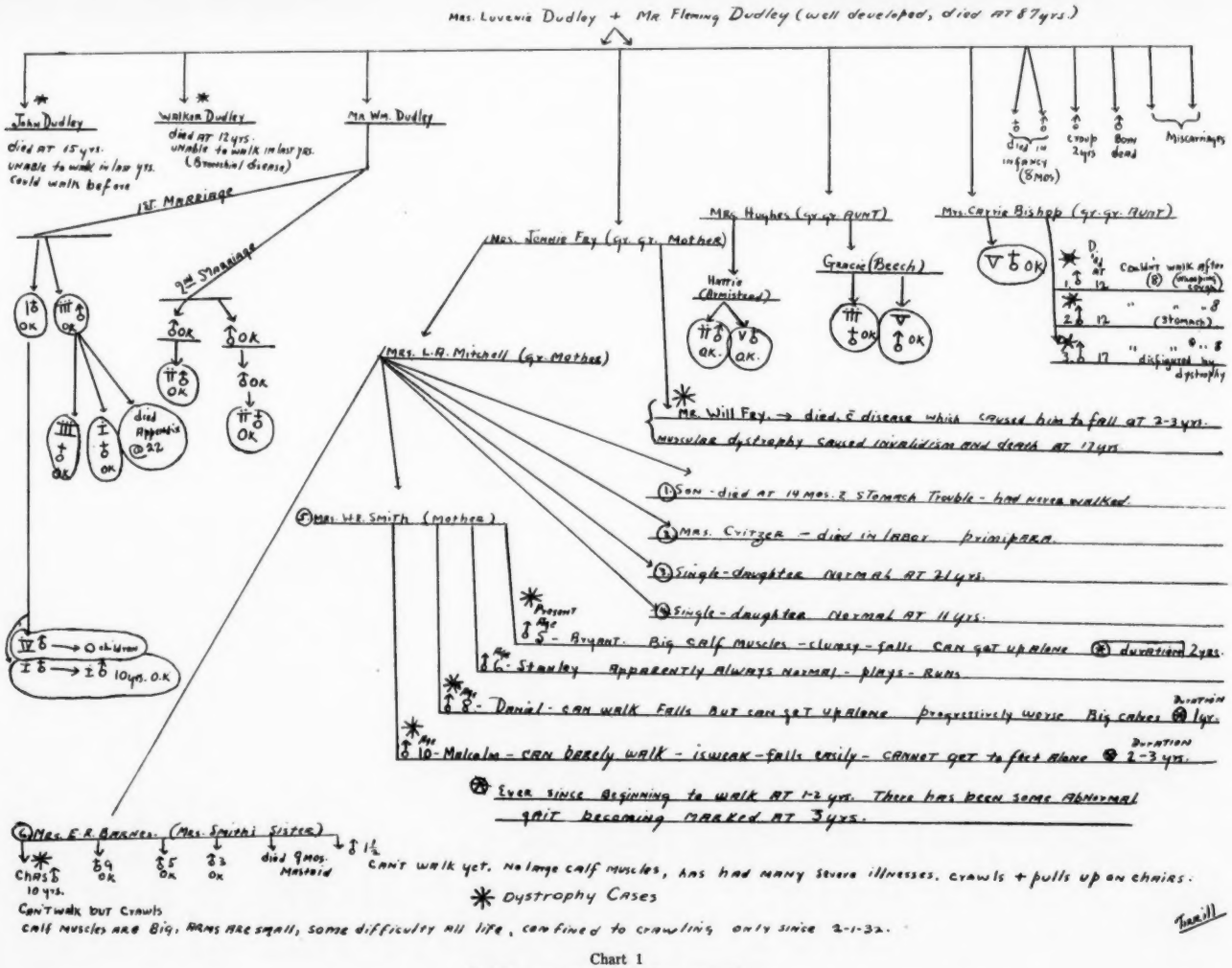
Mrs. Luvenia Dudley + Mr. Fleming Dudley (well developed, died at 87yrs.)
John Dudley
died at 15 yrs.
UNABLE to walk in last yrs.
Could walk before
Walkan Dudley
died at 12 yrs.
unable to walk in last yrs.
(Bronchial disease)
Mr. Wm. Dudley
1st. MARRIAGE
2nd Marriage
died in infancy (8 mos)
croup 2yrs
Born dead
Miscarriages
Mrs. Hughes (Gr. Gr. AUNT)
Mrs. Cattie Bishop (Gr. Gr. AUNT)
(Mrs. Jennie Fay (Gr. Gr. Mother)
Harrie (Committed)
Gracie (Beech)
D. at 12
Couldn't walk after (8) (stomach trouble)
" " 8 (stomach)
" " 8 .. 8
disfigured by dystrophy
Mr. Will Fay. → died. C disease which caused him to fall at 2-3 yrs.
Muscular dystrophy caused invalidism and death at 17 yrs
(Mrs. L.A. Mitchell (Gr. Mother)
(1) Son - died at 14 mos. ? Stomach Trouble - had never walked.
(2) Mrs. Critzer - died in labor primipara.
(3) Single-daughter Normal at 21 yrs.
(4) Single-daughter Normal at 11 yrs.
(5) Mrs. W.B. Smith (Mother)
Present Age
- Bryant. Big calf muscles - clumsy - falls. CAN get up alone (8) duration 2 yrs.
Age
- Stanley Apparently always normal - plays - runs
Age
- Daniel - can walk Falls but can get up alone progressively worse Big calves (8) Duration 1 yr.
Age
10 - Malcolm - can barely walk - is weak - falls easily - cannot get to feet alone (8) Duration 2-3 yrs.
Ever since beginning to walk at 1-2 yrs. There has been some abnormal gait becoming marked at 3 yrs.
(6) Mrs. E.R. Barnes. (Mrs. Smith's sister)
Chas 10 yrs.
died 9 mos. Mastoid
CAN'T walk yet. No large calf muscles, has had many severe illnesses. crawls + pulls up on chairs.
Can't walk but Crawls
Calf muscles are Big, Arms are small, some difficulty all life, confined to crawling only since 2-1-32.
* Dystrophy Cases

Chart 1
Family tree traced back four generations.

to them as etiological agents, although many times it has been suggested.

Pathology and Pathogenesis.—As early as 1883, Erb noted the muscle changes, first hypertrophy and then atrophy, with a substitution of fat and fibrous tissues; these changes have also been found quite consistently by many other workers. Degenerative changes in the neurocellular tissues of the mid-brain have been suggested for many years and a few times found, but not consistently in cases of true muscular dystrophy. Erb also suggested that a lesion in the central nervous system was responsible for the above mentioned muscular changes, but until recently this hypothesis had been essentially ignored. Many workers since have tried to locate definitely and determine a constant lesion, but no one had much success until Kure and his associates developed sufficient evidence to back up their impression that the lesion is an alteration of the autonomic innervation of the muscles. With this as a basis, Kure developed his new method of treatment for this disease after experiments and observations covering a ten-year period. The inability to reproduce the disease has prevented the development of absolute proof of its etiology and pathology.

Chemistry.—All changes in body chemistry have been centered about the creatine and glycogen metabolisms. McCrudden and Sargent reported a low blood sugar in one case thoroughly studied and explained the muscle weakness upon the marked lack of glycogen in the muscles. They were working upon the basis that sugar will stimulate exhausted muscles and that removal of the suprarenals causes a decrease in retained glycogen. Since the liver reservoirs of glycogen are replaced by fat in Addison's disease, they thought that probably these reservoirs in muscle tissue were similarly perverted. Since the suprarenals, pituitary and thyroid glands control the balance between the rate of formation of glycogen from glucose and its availability for absorption by the muscles, it was thought that the administration of epinephrine and pituitary extract would improve the patient clinically, and it did, also raising the blood sugar in one case from 0.072 to 0.085.

Milhorat, Techner and Karl Thomas this year have shown that cases of progressive muscular dystrophy show a creatinuria even on a creatine-free diet and excrete ingested creatine almost quantitatively, a complete reverse from the normal. This retention inability varies directly with the clinical severity of the disease. The administration of gelatine and glycine were found markedly to increase the creatinuria.

> "This significant relationship between glycine, a readily synthesized substance, and creatine which has been demonstrated to play an important role in muscle function, suggested that the prolonged administration of this amino acid might have an influence on the clinical and chemical course of the disease (progressive muscular dystrophy)." (Milhorat *et al.*)

Clinical Features.—The earliest symptoms of the disease as noted by the parents of an apparently normal child are a delay in walking, perhaps to twenty or more months, and an odd awkwardness in getting about. Some months later there becomes progressively apparent a considerable difficulty in going up and downstairs, and inability to rise promptly from a chair or the floor, necessitating in the latter a "climbing up the legs," an unstable and peculiar steppage gait with frequent falls without excuse. Finally the child cannot get about, becomes chair ridden, then bed ridden, and finally dies from an intercurrent infection. Oftentimes a short confinement due to a mild illness will hasten the progress so much that the child never gets back on its feet. Eventually the arms become involved further to add to the helplessness.

The duration of the disease averages seven years, with loss of walking and the beginning of upper extremity involvement occurring at about the same time. Infrequently the onset may be as late as fifteen to thirty years of age.

Physical Examination.—The child will stand with a marked sway back with shoulders well behind the hip plane, a protruding abdomen and prominent scapulae, since the shoulders are held forward. Markedly enlarged, pseudohypertrophic calves will be present in the Duchenne type, and marked atrophy in the others. Otherwise the child appears quite normal.

Activity shows a very marked weakness of the spinal, pelvic, shoulder and lower extremity structures as evidenced by the great difficulty in climbing or descending stairs, rising from or sitting upon a chair, and arising from the floor. This last phenomenon is the most characteristic sign and it will, therefore, be described.

Have the child lie flat upon his back and then ask him to get upon his feet. He will first turn onto one side in a half sitting position with one hand as a support, then onto hands and knees and later with much difficulty onto all fours, the hands and feet well apart; gradually he will work his hands toward his feet or vice versa until he can grasp his ankles, when he will climb

up his legs ("Gower's sign") until with a final jerky push he can get his body into the hyperextended position where the spinous processes can stabilize the posture and prevent him from losing his balance.

Another early sign is the phenomenon of "telescoping or loose shoulders," which is due to the marked atrophy of the girdle muscles. This can be noted by attempting to lift the child in the usual way by placing the hands under the axillae. Instead of the normal firmness of the shoulders, one gets the impression that the child has slipped through its shoulder girdle, and often the shoulders will rise to the ear level or more.

Other tests will show weakness of muscle function, depending upon the severity of the disease. Ergographic examinations will show a marked weakening of individual muscles.

DIAGNOSIS

The diagnosis is rarely difficult in the face of a progressive weakness in a child who on examination shows the peculiar signs enumerated above, especially the hypertrophy of the calves.

Barker has listed the following five points of differentiation between so-called primary myopathy and progressive muscular atrophy of neural origin, which is the condition most likely to mislead one:

(1) *The age of onset* in myopathy is usually very early and practically always before the age of thirty. In the central atrophies, on the other hand, the onset is characteristically in middle and later life.

(2) *Site of Involvement.*—In the primary myopathy, the original involvement is of the trunk and pelvic or shoulder girdles, while in the neural atrophies, in general, the more distal muscles are first involved.

(3) *Family Tendency.*—Frequently there is a history of another involvement in the family in the cases of myopathy. With certain exceptions, such as the Charcot-Marie-Tooth peroneal palsy, this is not true of the neural atrophies.

(4) *Fibrillary Twitchings.*—The muscles of the primary myopathies never show fibrillary twitching, which is usually present in cases of nervous origin. In fact, the presence of this condition is practically pathognomonic.

(5) *Spastic Phenomena.*—The presence of spasticity always indicates a primary central lesion. Rarely such a lesion might possibly be combined with a true myopathy.

PROGNOSIS

Cases starting late may have a fairly favorable prognosis for an ordinary span of life with some limitations due to muscle weakness.

Those starting below the age of eight will probably succumb before sixteen, and below six, before twelve. Those living beyond, or starting after, fourteen usually retrogress very slowly.

The newer methods of treatment have not had time to show effects upon the prognosis, but the old standards seem due for a change if the hoped-for has occurred. If the child is not forced to be in bed by weakness, other disease, or injury, do not retard activity, as "once in bed always in bed" has been a basic rule.

TREATMENT

The treatment in the past has been universally futile, although scattered cases have been reported where cure or marked improvement has occurred by the use of carbohydrates, calcium, glandular extracts, and physiotherapy. About as many cases have been reported showing no improvement whatsoever. Epinephrine has been used before Kure and Okinaka reported on it, but with totally opposite results from theirs.

Two methods of treatment have been offered recently, both of which show results far above any in the past and bid fair to revolutionize our ideas about this disease, if preliminary observations are borne out by the tests of time and continued usage.

In 1930, Kure and Okinaka reported the results of ten years' work on this disease and advised the use of epinephrine and pilocarpine hypodermically to stimulate the autonomic innervation of the muscles and thereby improve their tone.

> "The method of treatment is simply the injection subcutaneously of 0.2 to 0.3 c. c. of 1:1000 adrenalin and 0.1 to 0.2 c. c. of 1 per cent solution of pilocarpine hydrochloride daily, or every other day, up to 60 doses, without interruption."

A definite increase in muscle function was noted after about 30 injections, although some cases were much more prompt to react and others less so. If no improvement is noted after or during the first 50 doses, the prognosis is doubtful. Except for a slight palpitation in a few cases, no undesirable reactions were noted.

It is, however, the belief of Kure and Okinaka that this method is not a curative one, but that it will help muscle tissue to reestablish its normal functions in favorable cases. Their summary after treating 12 cases is herewith quoted:

"(1) Adrenalin and pilocarpine injections are of therapeutic value in muscular dystrophy, at least in checking the continued progression of the disease. Injections were repeated daily or every other day. In most cases over fifty injections were given. Good results were observed usually within fifty injections.

"(2) With the exception of palpitation, the treatments had no untoward reaction, especially in regard to cardiac hypertrophy and elevation of blood pressure."

Twelve cases were treated by Kure and Okinaka with a "functionally complete cure in two, a very marked improvement in six, and no improvement in the others which were very far advanced." The results were proportionately better in the earlier cases.

Garry de N. Hough, Jr., of Springfield, Massachusetts, deserves the credit for presenting this method of treatment in the English literature with the results of his treatment of 15 cases in varying stages of the disease out of his series of 28. All of his cases were of the Duchenne (pseudohypertrophic) type in white males; he states he has never seen the condition in a female.

He analyzes his series as follows:

"In sixteen cases there has been a report following treatment with subcutaneous injections of adrenalin and pilocarpine. Every case showed some improvement in spite of the fact that many were in an extremely advanced stage of the disease, far beyond a time when much could possibly be anticipated. In eight of the cases, the improvement was slight. In four the improvement was moderate, consisting of a very definite objective increase in strength. In four cases the improvement was marked. These represent relatively early cases in which the possibility of help might be expected. It is at times difficult to distinguish between the definite result of the treatment and a possible psychological alteration which seems to play a very definite part. In the eight cases showing moderate and marked improvement, however, the result is definitely beyond question. In one child there has been a practically complete functional cure." Two cases were converted from bed patients to wheel chairs. "The results to date in this series bear out the conclusions of Kure and Okinaka that in early cases a functional cure may be obtained in progressive muscular dystrophy, a previously hopeless condition. In later cases some amelioration of symptoms can be obtained."

In February, 1932, Milhorat *et al* offered an entirely new method for treating cases of progressive muscular dystrophy based on the effects of glycine administration upon the creatine metabolism, as mentioned previously.

They treated six cases, three of progressive muscular dystrophy and three of pseudohypertrophic muscular atrophy. The method was to feed the patient a daily quantity of five grams of glycine for eight periods of three months each, three weeks intervening between periods. This increased the creatinuria definitely. If 15 to 20 grains were given, the creatinuria increased to 300 to 500 mg. The more advanced cases secreted more than the early ones. After a period of a few weeks, varying with the severity of the disease, the creatinuria decreased, despite the continued use of glycine, until it reached its former level.

Coincident with the ingestion of the glycine there is a rise in the creatinine output and an improvement of the patient to hold ingested creatin, but these disappear in a few weeks after the cessation of the glycine ingestion, and will return when it is again started.

The patient's clinical condition improves very markedly along with the improvement noted by chemical examinations. At first there is usually a feeling of "crawling or rumbling" in the muscles, sometimes sufficient to disturb the patient's sleep. This is especially evident in the worse affected muscles. These will slowly disappear, but will recur on starting the next course of treatment. One case had these sensations before treatment and they entirely disappeared on starting the glycine. There is, slowly, a disappearance of fatigue with an attempt to try new activities and improve on the old.

Control cases of amyotrophic lateral sclerosis, rheumatism and idiocy showed no increase in creatinuria on injecting glycine, and no improvement clinically or in metabolism tests.

They feel that the ingestion of glycine bids fair to be of immense value in the treatment of this hopeless condition.

Glycine, or glycocoll, is an amino acid, CH_2NH_2COOH.

Today, I wish to report a series of 20 cases with an analysis of the results thus far. I am indebted to Drs. Mason Romaine and L. T. Royster for the data on 7 cases, as they have been supervising the treatments and observing the results. Dr. Royster also supplied me with the family tree for the three cases, brothers of the present generation, in a family traced back three generations with 10 cases in all (*Chart 1*).

Of the 20 cases listed, 16 have been under treatment with one or more of the above described methods. Fourteen have been treated and observed for longer than six months, and 9 have been carefully followed for more than twelve months. Eighteen hundred thirty-four treatments have been given, divided as follows: 1,529 doses of pilocarpine and epinephrine, 190 doses of glycine (glycocoll) alone, and 115 doses of both, given simultaneously. Thirty to 60 doses were required before any changes were noted. (*Table 1.*)

I am presenting herewith the statistical data of all cases treated, but due to the fact that two cases have been treated for less than two months I shall confine comparisons to the 14 cases observed six months or longer. Since accurate figures of physiological activity of each patient cannot be collected without the expenditure of considerable money, the comparisons listed are based upon personal observations and the actual accomplishments of the patient as noted by himself or his parents. I have, therefore, used terms

Table 1

STATISTICAL DETAILS OF SIXTEEN CASES

(Stars of the same number indicate members of the same family.)

	Name	Age	Years of Duration	Months of R	Treatments PE	G	PE&G	Total	Condition at First: Gait	Bend	Rise	Steps	Condition at Present: Gait	Bend	Rise	Steps	Heredity
1	*1 A.S.	5	1	14	150			150	Fair	Good	Good	Good	Very good	Very good	Very good	Very good	B-1
2	*1 P.S.	8	2	14	(1) 122	(2) 28		150	Very bad	Very bad	Very bad	Very bad	Very bad	Very bad	Very bad	Very bad	B-1
3	*2 R.W.	6	5	14	214			214	Fair	Bad	Bad	Bad	Fair	Bad	Bad	Bad	B-1
4	*2 C.W.	9	1?	14	214			214	Fair	Very bad	Very bad	Very bad	Bad	Very bad	Very bad	No	B-1
5	E.C.	8	5	7	(1)21 (3)24	(2) 72		117	Fair	Bad	Bad	Bad	Good	Fair	Fair	Fair	
6	D.G.	9	7	12	150		50	200	Good	Bad	Bad	Bad	Good	Fair	Fair	Fair	
7	A.S.	10	3	6	(1) 28		(2) 65	93	No walk 3 months	Sits unsteadily No	No	No	No	Sits steadily. No	No	Uses arms freely No	
8	A.R.	10	8	12	175			175	Completely bed ridden. Not even turn over in bed. Deformities				*After 60 doses could sit up, feed himself, push wheel chair, generally stronger. Retards between courses				
9	*3 B.R.	10	5	12	78			78	Bad	Very bad	Very bad	No	Good	Bad	Bad	Very bad	B-2
10	*3 C.R.	14	7	12	78			78	Bed ridden. Deformities. Unable to raise arms. Tries to sit, but is weak				Can raise arms when lying or sitting. Sits up				B-2
11	D.R.	40	24	12	85			85	Fair	Bad	Bad	Bad	Good	Fair	Fair	Good	B-5
12	*4 B.S.	5	2	6	(1) 50	(2) 30		80	Good	Good	Fair	Fair	Good	Good	Good	Good	
13	*4 D.S.	8	1	6	(1) 50	(2) 30		80	Bad	Bad	Bad	Very bad	Bad	Bad	Bad	Very bad	
14	*4 M.S.	10	3	6	(1) 50	(2) 30		80	Very bad	No	No	No	Very bad	No	No	No	
15	H.P.	14	12	½	10			10	Fair. Foot deformity	Bad	No	No	Insufficient time				
					30			30									
16	E.B.	4	2	1	1529	190	115	1834	Very good	Very good	Very good	Very good	Insufficient time				B-1

of daily parlance to describe the degrees of activity, and have limited the comparison to the four most common and evident signs of the disease. I have recently been informed that work has been started in two different schools along physiological and biochemical lines, so that some interesting results should be forthcoming in due course. (*Table 2.*)

Table 2

COMPARISON OF CLINICAL IMPRESSIONS FOURTEEN CASES

	Gait		Bend		Rise		Steps		Total	
	A	B	A	B	A	B	A	B	A	B
Very good	0	1	0	1	0	1	0	1	0	4
Good	2	5	2	1	1	1	1	2	6	9
Fair	5	1	0	4	1	3	1	2	7	10
Bad	2	2	5	3	5	3	4	1	16	9
Very bad	2	2	3	2	3	2	3	3	11	9
No walk	3	3	4	3	4	4	5	5	16	15

A=At start of treatment. B=6-14 months later.

Of 2 bed ridden cases: 2 sit up, 1 sits steadily and upright; 2 use arms, 1 weakly, 1 freely; 1 feeds self, holds book, washes face.

Nine cases showed improvement of more or less degree; 5 cases did not improve, with one becoming decidedly worse. Of the 5 cases which did not improve, three were under careful supervision for fourteen months and were treated consistently with pilocarpine and epinephrine; one of these has recently been changed to glycine, but shows progressive weakness. The younger the patient, and the earlier in the course of the disease that treatment is instituted, the better the prognosis apparently. It is, indeed, encouraging at least that 9 cases out of 14 have held their own or done better, which is more than can be said for all methods devised heretofore. The bed ridden cases showed more immediate progress than any of the others (*Tables 3* and *4*).

All but 5 of the 16 cases studied have one or more relatives affected. Males make up the entire series of 20 cases, no females having been seen recently. I can recall having known only 2 cases in girls, but have recently been informed that 2 more are at present located in the rural sections of Maryland. I hope to have the privilege of examining them and adding them to my series.

Table 3

COMPARATIVE RESULTS IN FOURTEEN CASES

	P.—E. P.	P.E.—G.	P.E.&G.	
No. Cases	7	1	6	
Very improved	5			1 retards in rest periods
Slightly improved		1	3	3 retard in glycine periods
Not improved	2		3	

P.E.=Pilocarpine and epinephrine.
G.=Glycine or glycocoll.
Impression: Pilocarpine-epinephrine method is best.

Table 4

SUMMARY

Cases	Ages	Duration in Years	Treatment in Months	Medication			
				P.-E.	G.	P.E.G.	Total
13	5-14	3.3 (1-8)	10.2 (6-14)	1376	190	115	1681
1	40	24	12	85			85
14				1461	190	115	1766

P.E.=Pilocarpine and epinephrine.
G.=Glycine or glycocoll.
P.E.G.=Pilocarpine and epinephrine and glycine.

The best results were noted in those cases treated with pilocarpine and epinephrine. Several cases retarded noticeably during the intervals of rest between each 60 doses, or during the glycine series when interspersed with pilocarpine-epinephrine. The one case treated simultaneously with both agents throughout 65 doses has shown only very slight change, although he has not retrogressed. All cases have received active physiotherapy during the period of observation.

One case of progressive muscular atrophy, Charcot-Marie tooth type, was treated with 50 doses of pilocarpine-epinephrine as a check. No demonstrable changes could be noted.

CASE REPORTS

Case 1.—A. S., age 5, was admitted to Kernan Hospital October 17, 1931, and discharged February 28, 1932. He is a brother of *Case 2.*

The complaint was that he stumbled and was unable to get up subsequently. He had one brother living and well, and one brother, age 9, had the same condition. No previous cases of this disease were known in the family.

The past history was negative.

Until the spring of 1931 he was perfectly well. Then he began to stumble when he walked, the calf muscles "swelled up," and he became tired easily and lost his appetite, the same process that his other brother had gone through. There was some nervous irritability.

There were no tremors. There were scars and bruises over the body, especially the forehead and knees, due to falls.

Slipping shoulder girdle, large calves, stepping, sway back gait and sway back stance were noted. The muscles were very weak, especially the extensors of the thighs. He pushed on the knee only once in rising from the floor.

One hundred and fifty doses of 0.2 c. c. of epinephrine 1/1000 and 0.2 c. c. of pilocarpine 1 per cent every other day at first and then daily with massage were given.

After forty doses, definite improvement was noted in the gait and he rose from the floor without touching his legs. He was discharged very much improved.

Case 2.—P. S., age 8, was admitted to Kernan Hospital October 17, 1931, and discharged February 28, 1932. He was a brother of *Case 1.*

The complaint was that he stumbled while walking and was unable to pick himself up.

The family history was negative except that a younger brother had the same disease.

The past history was negative.

About two years previously the mother had noted that he began to stumble while walking and that the calf muscles began to swell. He was examined by the family physician, who said he might outgrow it and that there was no cure. The same information was received from Johns Hopkins in 1930 and Garrett Hospital in 1931. He was sent to Kernan's from the University of Maryland Hospital. He had marked loss of appetite and had become nervous, irritable and easily upset.

Physical examination showed typical signs of an advanced case just before losing ability to stand on the feet. The circumference of the calves was only 1 to 1½ inches smaller than the thighs.

One hundred and twenty-two doses of epinephrine and pilocarpine and massage as in *Case 1* and twenty-eight doses of glycine were given.

Improvement in strength of legs as noted in gait, and arms as noted by increased activity; otherwise only slight improvement noted.

Case 3.—R. W., age 6, was admitted to Kernan Hospital December 8, 1931, and discharged February 19, 1932. He is a brother of *Case 4.*

The complaint was of weakness and inability to walk.

One brother, age 11, had severe infantile paralysis; one older brother (*Case 4*) had the same disease as the patient; one sister died at four months.

He had walked at 2½ years; was now in the first grade of school.

The parents think that weakness has been progressive since his birth. He has always walked peculiarly, but now it is much worse. The parents did not know when the calves enlarged.

The typical posture, gait and active signs of dystrophy were noted.

Two hundred and fourteen doses of epinephrine and pilocarpine were employed as described in *Case 1.*

Slight improvement only was observed. This case was more advanced than *Case 1* and *Case 2,* even though younger than *Case 2.*

Case 4.—C. W., age 9, was admitted to Kernan Hospital October 23, 1931, and discharged February 19, 1932. He is a brother of *Case 3.*

The complaint was of difficulty in climbing the stairs.

One brother, age 6, has the same disease (*Case 3*).

The past history is negative.

Up to one year ago he showed no signs of the disease. Then the parents began to note that his legs collapsed under him and he stumbled and fell and had difficulty in getting up. He was examined at Johns Hopkins and Garrett Hospitals without relief and then sent to Kernan's through the University of Maryland Hospital.

There was a typical picture of advanced dystrophy with marked weakness of the extensors of the legs and arms. Treatment with 214 doses was administered as in *Case 3.* He was only slightly improved.

Case 5.—E. C., age 8, was treated at the University of Maryland and Kernan Hospitals.

There was a typical history of pseudohypertrophic muscular dystrophy starting five years previous to the first examination in June, 1932.

Examination showed a fairly good gait, but marked difficulty on rising from the floor or bent position, and climbing stairs, which was almost impossible. After seven months' treatment there was a distinct improvement in all activities to the point where he could rise from the bent position with a push of one hand only.

Epinephrine and pilocarpine injections were begun immediately and continued for 21 treatments, when funds became available for the purchase of glycine. In order to try an early case on glycine this patient was changed to glycine for 72 doses, but since he retrogressed decidedly and rapidly he was put back on epinephrine-pilocarpine and showed definite improvement even after 14 doses.

He received—

(1) Epinephrine-pilocarpine, 21 doses.
(2) Glycine, 72 doses.
(3) Epinephrine-pilocarpine, 14 doses.

Case 6.—D. G., age 9, was admitted to Kernan Hospital April 15, 1932, and discharged April 23, 1932.

The story here is typical of the others. No antecedents were afflicted similarly. He had had 25 doses of epinephrine and pilocarpine previously with slight improvement only.

He has been started on another course, which is to continue for at least 100 doses. Slight improvement only has been noted. He was given 100 doses of pilocarpine and epinephrine with 50 doses of glycine coincident with the last 50 doses of the first solutions.

SUMMARY OF CASES 1 TO 6

Except for *Case 5,* all the above cases are continuing to receive epinephrine and pilocarpine for an indefinite period. I expect to use glycine in addition to the above so that nutriment can be made more available to muscles than was previously the case.

Case 7.—A. S., age 10, was treated at Kernan Hospital.

The duration of the disease was three years.

It was a typical case with rapid advancement so that on admission he had been unable to walk at all for three months previous to June 30, 1932, and he could sit only if propped carefully in pillows. He was quite weak in his arms and was rapidly becoming helpless. Both Achilles tendons were contracted.

Epinephrine and pilocarpine alone were given for 28 doses, then glycine was added, for a series of the

combined method of 65 doses. Both Achilles tendons were lengthened in September, 1932.

This patient can now steadily sit alone, can push a wheel chair, and is trying to stand holding to the bed.

Case 8.—A. R., age 10, had shown symptoms of the disease for 8 years.

His condition had become such that he was limited to sitting in bed or a wheel chair, and he had contracture deformities.

Epinephrine-pilocarpine, 175 doses were given.

After about 100 doses there was very marked improvement as shown by increased strength in the arms, even to pushing a wheel chair. The improvement continued as long as treatment was kept up, but there was retrogression between courses.

Case 9.—B. R., age 5 years, was a brother of *Case 10.*

This was a typical case with a steadily progressive downward course. When treatment was started he walked with much difficulty, could hardly go up stairs, and fell if he tried to go down.

Pilocarpine and epinephrine injections were given daily for 78 doses. After the first 25 doses, this patient could walk up stairs and could come down if he placed the left foot first each time, but he would fall if he tried to alternate the feet. Later he was able to alternate the feet going down without falling. He also could take walks outdoors without aid.

Treatment was stopped due to the patient's inaccessibility.

Case 10.—In C. R., age 14 years, the duration of the disease was seven years. He is the brother of *Case 9.*

This patient was in a much further advanced condition than his brother, *Case 9.* He was limited to sitting in a chair and bed. He had contractures of the knees and feet, was unable to raise his arms from his lap when sitting.

Pilocarpine and epinephrine injections were given daily for 78 doses and then stopped because of the inaccessibility of the patient.

Some improvement was noted in the general tone of the muscles, and actively the arms could be lifted about a foot from the lap when he was sitting and well into the air when lying down. The mother felt there was improvement.

Case 11.—In D. R., age 40 years, the duration was twenty-four years. His five brothers probably all were affected.

The onset was at 16 years, although he never could run fast, even though his general strength seemed good. His legs were always large. From the age of 16 to 20 he had to climb his legs to get up into the erect position. There has been a mild but steady progression of the disease until now he walks with sway back and swinging gait. Has had many types of treatment, both physical and medicinal.

Pilocarpine and epinephrine injections were given daily for 85 doses. Definite progress was noted in that the pain about the pelvis, probably due to strain, disappeared; he could climb stairs better, though still with difficulty, and could raise his arms above his head with less effort. He has kept this improvement for at least six months.

Case 12.—In B. S., age 5 years, the duration of the disease was two years. He is the brother of *Cases 13* and *14.*

This was a typical case in the youngest boy of a family with two other boys affected and one girl not affected; also a family with repeated cases for three generations in all branches.

Pilocarpine and epinephrine injections were given for 50 doses and stopped, as there was no dramatic improvement and cooperation was poor. Three months later 30 doses of glycine, 5 mg. per dose, were given.

Comparing the present condition with that before instituting treatment, there is certainly some improvement in strength and activity, especially with reference to rising from the floor and going up steps.

A new study and method of treatment are being tried based on the phosphocreatinine metabolism.

Case 13.—In D. S., age 8 years, the duration was one year. He is a brother of *Cases 12* and *14.*

This patient was in a much more advanced condition than his brother, *Case 12,* as noted by a bad gait and almost total inability to get up steps.

The same series as in *Case 12* was given him, that is, pilocarpine-epinephrine, 50 doses; glycine, 30 doses.

No improvement was noted.

Phosphocreatinine studies are being carried out on this case also.

Case 14.—In M. S., age 10 years, the duration was three years. He is a brother of *Cases 12* and *13.*

This boy was even further advanced than either brother. In fact, he was nearly chair-ridden, being able to walk only a very little and that badly. If he fell he could not move without aid.

The same series was given him as to the other brothers, but no improvement was noted.

Case 15.—In H. P., age 14 years, the duration was twelve years. He had been delivered instrumentally.

He was a large fat boy with mental retardation, congenital anomalies, and possible pituitary disturbances as complications of a typical case of dystrophy. He had contractures of the Achilles tendons.

Ten daily injections of pilocarpine and epinephrine have been given to date. Insufficient time has elapsed for check observations.

Case 16.—In E. B., age 4 years, the duration was two years. One brother also was affected.

This was a very early case with good strength and activity, though with the typical posture and mild shoulder girdle changes.

Thirty daily injections of pilocarpine and epinephrine have been given to date.

Insufficient time has elapsed for check observations.

Case 17.—In C. F., age 21 years, the duration was twenty years.

This typical case, now bed-ridden, has been under observation for eight years. He cannot raise his legs from the bed and has contractures of the Achilles tendons.

All older methods of treatment were tried without avail. No treatment has been instituted as yet.

Case 18.—In H. A., age 36 years, the duration was 24 years.

This typical case is now chair-ridden and is becoming weaker. All treatments have been useless so far. He has been examined at almost every clinic in the East.

We are to begin a course of treatment shortly.

Case 19.—In J. M., age 27 years, the duration is ten years. One brother is similarly affected.

Atrophy and weakness began in the upper extremities and progressed to the lowers. He has been slowly getting weaker.

He has started a course of pilocarpine-epinephrine. Time is insufficient as yet for check observations.

Case 20.—In Miss K., age 38 years, the duration was ten years.

This is not a typical case, but is apparently one of progressive muscular dystrophy with atrophy as the most prominent feature.

This is the second female in my experience to be affected. The other girl is now dead.

Treatment has just been started with pilocarpine-epinephrine. Insufficient time has elapsed for check observations.

CONCLUSIONS

Two new methods have been advanced for the treatment of progressive muscular dystrophy. In a series of 14 cases treated, better results were obtained with pilocarpine-epinephrine. No large series has been treated with glycine, so that its value is still to be tested, although the cases shifted from pilocarpine-epinephrine to glycine showed decided retardation signs as noted by the examiner, the teachers, and the parents.

The idea that the combined method might offer better advantages by giving the muscles more food (glycine) to replace the lost creatin and by stimulating their autonomic nerve supply with pilocarpine-epinephrine has not as yet proven anything either way. It is probable that studies of the phosphocreatine metabolism will present some better preparation which will act on a sounder physiological basis.

The fact that some cases have been apparently improved and some held stationary is at least worth while, and gives a basis for the continued use of the method clinically with the hope that refinements will be forthcoming. A larger series and much more time will be necessary before conclusions may be reached.

Do not put the patient to bed for any cause, unless it is absolutely necessary, as the stimulation of muscle activity is essential to the retention of a minimum of function. The patient rapidly retrogresses under rest.

SUMMARY

(1) The history of the disease is briefly outlined.

(2) The usual classification of the types of the disease are listed.

(3) The theories of etiology are mentioned.

(4) The effect of heredity is discussed and one family tree of four generations is presented.

(5) The pathology and pathogenesis are reviewed.

(6) The creatine and sugar chemistry is summarized.

(7) The main clinical features of history, physical examination, and diagnosis with Barker's differential points are given.

(8) The usual poor prognosis is mentioned.

(9) Two new methods of treatment are offered with a summary of the results in sixteen cases.

(10) The suggestion to combine the two methods in the future is advanced.

(11) Further research is deemed necessary for a better understanding of muscle physiology, especially the phosphocreatine metabolism which seems mostly affected.

(12) Longer and more extensive clinical studies and observations are needed before definite conclusions can be attempted.

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SYPHILITIC RADICULITIS*

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The syndrome of nerve root pain has been recognized for a long time, but its diagnostic importance has been appreciated only during the last ten years. It has proved to be of great help in the localization of the pathological process in osteo-arthritis of the spine and in spinal cord tumors. Excellent studies on this question have been published, particularly by Mayer,[1] Gunther and Sampson,[2] and more recently by Gunther and Kerr.[3] The latter article contains an excellent bibliography.

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The close relationship of the subarachnoid and perineural spaces has been recognized for many years, particularly by Sicard,[4] and has been demonstrated very clearly recently by Dyke and Deery.[5] The pathway for peripheral painful sensations has been accurately demonstrated by Davis and Pollock.[6] These workers have shown that pain sensations are not carried by the sympathetic nervous system, as was held formerly, but are borne exclusively by the posterior roots.

The term, radiculitis, should be limited strictly to an inflammatory affection of the short intrameningeal portions of the spinal nerve. As a matter of fact, the process is rarely confined to this portion, but extends both peripherally and centrally to include the extrameningeal portions of the spinal roots, the posterior ganglia, and the central areas of the spinal cord at the ends of the posterior nerves. The syndrome of radiculitis, however, remains the same. Its outstanding feature is pain in the areas innervated by the affected nerves.

The etiological factors of radiculitis are many. In addition to the more mechanical causes mentioned above, infection is perhaps the commonest. Epidemics of influenza have at times been accompanied by radiculitis, as in the series of cases reported by Stiefler and Troyer.[7] Other epidemics of radiculitis, presumably infectious in origin, have been described (Strauss and Rabiner[8]), although the etiology has not always been clear. Syphilitic radiculitis is undoubtedly of common occurrence and the appearance of nerve pains during the various phases of syphilitic infection is well known. The process may involve any of the spinal roots, but in syphilitic disease the lower segments of the cord are most frequently affected.

The symptoms may vary from a simple localized nerve root pain without evidence of functional disability to an extensive process with the production of the typical Guillian-Barre polyneuritic syndrome, the rarer syphilitic chronic pachymeningitis of the cervical region and the syndrome of Erb's spastic paraplegia. There is in most instances an associated meningeal involvement. This may be so marked as to produce the signs and symptoms of meningitis, so pronounced as to overshadow the signs of nerve root disease.

Most cases of syphilitic radiculitis reported during the past ten years have been from French and German clinics. Some of the more outstanding articles in the French literature exemplifying the various types of radiculitis are those by Trabaud,[9,10] Dragenesco, *et al.*,[11] and Faure-Baulieu.[12]

Although the syndrome is undoubtedly well recognized in this country, adequate discussions are lacking. It is for this reason that the following cases are reported. They illustrate three types of syphilitic radiculitis and demonstrate the varied symptomatology of this condition.

Case 1.—E. W., age 26, a white woman, married, a domestic servant, was admitted June 8, 1932; discharged August 27, 1932. She complained of indigestion of three and one-half months' duration.

The family history was irrelevant.

She had been married seven years. In August, 1921, her husband contracted a penile sore and received three intravenous injections. The patient cohabited with her husband in December of the same year. One month later the husband contracted another penile sore, followed two months later by a skin rash. In May, 1932, the husband was ill for one month with severe recurrent headaches.

Four children were living and well; one (the youngest) could not walk, and had a sore mouth. Patient had had one miscarriage, in her last pregnancy (fifth) at two months, one year previously.

She had had the common childhood exanthemata and influenza at 17. One year before, there had been swelling and stiffness in both knees. Since then the soreness and stiffness has been confined to the right knee. One year before there had been a severe and enduring sore throat, associated with severe, dull aching radiating from the base of the skull down the back and sides of her neck.

Syphilis and gonorrhea were denied by name and symptoms. She had had no previous blood Wassermann tests.

Three and one-half months before entry into the hospital, the patient developed a severe pain in the interscapular region. Two months later the pain radiated through to the epigastrium and to the lower chest on both sides. These symptoms were present almost constantly and had no relation to meals. They were not relieved by soda. Almost from the onset of these symptoms the neck had felt stiff, especially in the morning, making it difficult for her to fasten her shoes. Two weeks before entry to this hospital, her right leg and foot became numb; she had staggered occasionally during the preceding two months. There had been obstinate constipation for three months and transient diplopia one month before. There was occasional "fever" in the evening for three months. She had lost nine pounds in weight during the previous three months, with a good appetite.

The temperature was normal. There was slight tachycardia. She was fatigued. She was mentally clear, but slow in responding. There was a mask-like face. The right pupil was slightly larger than the left. The right pupil reacted normally; the left showed hippus. The eye grounds were normal. The heart and lungs were normal. There was a decrease in perception of all sensations in the right leg from the knee down. There was a positive Kernig on the right. The abdominal reflexes were absent. There was a slight incoordination of the right upper extremity. The spleen was palpable.

Laboratory Examinations.—There were 12.5 grams of hemoglobin per 100 c. c. of blood. The red blood count was 4,190,000; white count 8,000; differential leucocyte formula normal, and urine normal. The blood Wassermann June 9 was a suggestive negative. Lumbar puncture June 9 showed 10 cells (lymphocytes) Pandy +; Wassermann 44; colloidal mastic test: 55555543.

Subsequent Course.—Following the first injection of arsphenamine, 0.3 gm., there was a marked improvement in the general condition and after the second treatment one week later the pains had disappeared and the sensitivity and functional use of the right leg were practically normal. The blood Wassermann turned strongly positive following the first injection of arsphenamine. The patient was discharged symptomatically well four weeks after admission to this hospital, to be treated by her family physician.

Case 2.—A. W., age 51 years, a white farmer, married, was admitted March 18, 1932, and discharged March 27, 1932.

He complained of pain in the right hip, weakness, loss of weight, marked constipation, and pain in the stomach of two months' duration.

The family history was irrelevant. He had been married 27 years. His wife was living and well. Four children were living and well. The wife had had one miscarriage (fifth pregnancy) five years before.

His general health had always been excellent. He had had chicken pox at the age of 25 years, and typhoid at 26 years. Following an accident 25 years previously he developed an inguinal hernia on the right side. Following an abscess in the left groin one year before, he developed a hernia on that side also. A system review was otherwise negative.

He denied gonorrhea and syphilis by name and symptoms.

Five months previously he developed a constant aching pain in the right hip with tenderness on pressure, but no increase in pain on motion. During the following 6 to 8 weeks he had an occasional pain in the right knee. Three and one-half months before admission, the patient had a sudden attack of numbness and tingling in the right leg, beginning at the hip and rapidly extending to the toes. These symptoms had persisted in varying degree up to the time of examination. Simultaneously there appeared pain and stiffness in the lower spine, accentuated by standing or bending forward. This pain and stiffness gradually extended upwards until his whole back felt stiff. Two months before admission he began to have sharp pains below the xyphoid radiating to the umbilicus, not associated with eating. These pains have recurred in short paroxysms. One month before admission he developed a sharp pain in the left lower chest, accentuated by breathing, which was alleviated by strapping the left chest. There was no cough and no fever. In the preceding three weeks there had been some weakness in the right leg, inconstant. He had had marked constipation since the onset of the present illness, increasing nervousness and rapid loss of weight (40 pounds in 5 months). There had been almost complete loss of libido and potentia during the previous three months.

His temperature, pulse and respiration were normal. There was no evidence of marked loss of weight. He was mentally clear and cooperative. There was total adentia. The mucous membranes were of good color. The heart and lungs were normal. Blood pressure was 124/70. There was slight stiffness, without tenderness of the lumbar spine. The abdomen was normal. The cranial nerves were normal. The pupils reacted normally to light and accommodation. There was no muscle weakness. Sensation was normal. The left knee jerk was hyperactive; the right knee jerk was obtained on reinforcement only. Coordination and muscle sense were normal.

Laboratory Examinations.—There were 13.0 gm. of hemoglobin per 100 c. c. of blood. The red count was 4,960,000; white count 11,100. The differential leucocyte formula was normal. The urine was normal. Stools were normal. Blood Wassermann taken March 19 was negative. X-ray of the large bowel (barium enema) showed possible chronic colitis.

The patient refused spinal puncture and was discharged in the care of his family physician. His general condition remained about the same until September of this year, when, after marked aggravation of his symptoms, his blood Wassermann was found to be 2 positive; his spinal fluid showed 89 cells (lymphocytes), a markedly positive test for globulin, and a 4+ Wassermann reaction. These findings were reported to us by his family physician, who is now treating the patient.

Case 3.—B. S., age 50, a white man, married, a baker, was admitted October 17, 1932, and discharged October 20, 1932.

He complained of aching in both legs of 2 years' duration. His family history was irrelevant.

He had been married twice. His first wife died in 1913 of heart trouble. She bore him two children, who were living and well. She had no miscarriages or still births. He married his second wife, now living and well, 13 years previously. She has not been pregnant.

He denied syphilis and gonorrhea by name and symptoms. He was examined in a Northern hospital, which he visited for the same complaints, in 1929. His blood Wassermann then was negative. Another blood Wassermann test done in August, 1932, was also negative.

Two years before our examination he began to have "throbbing pains" in both calves radiating to the medial surface below the knees. This pain has been present almost constantly since, not accentuated by motion or pressure on legs. It is, however, more severe after the patient has been on his feet a long time. He has visited various hospitals, spas and sanitaria for this ailment without improvement. At times there has been tingling at the bottom of both feet.

His temperature, pulse and respiration were normal. He was mentally clear, distinctly overweight, and showed a slight external strabismus of the left eye. The pupils were slightly irregular, but reacted normally to light and accommodation. The eye grounds were normal. The cranial nerves were normal. The tendon reflexes in the upper extremity were hypoactive. The left knee jerk was absent; the right knee jerk was obtained on reinforcement. The same was true of the ankle jerks. The plantar response, cremasteric and abdominal reflexes were normal. The vibratory sense was diminished below the hips. There was no disturbance of sensation. The coordination and muscle

sense were normal. The rest of the physical examination was normal; there were no scars on the genitalia.

Laboratory Examinations.—There were 12.6 gm. of hemoglobin per 100 c. c. The red count was 4,900,000, and the white count 5,100. The differential leucocyte picture was normal, and the urine normal. The blood Wassermann October 18, 1932, was negative. A provocative blood Wassermann October 24 was negative. Spinal fluid examination October 21, 1932, showed 8 cells (lymphocytes); Pandy slightly positive; Wassermann 4+; colloidal mastic test: 11232100.

The patient is now under treatment. Following the second injection of arsphenamine, there was almost complete disappearance of the pain. The blood Wassermann, incidentally, has become strongly positive.

DISCUSSION

In 18 cases of radiculitis reported during the past five years the blood Wassermann was negative in 16 and positive in 2, both of which showed definite evidences of a syphilitic meningitis. The last two of our patients denied any possibility of a syphilitic infection and had negative blood Wassermann reactions. Our first patient had been exposed to syphilis and her blood Wassermann reaction was suggestively positive. She had, in addition to rather extensive spinal radiculitis, distinct neurovascular syphilis and syphilitic meningitis.

The other two patients present a different problem. The second patient had evidently a unilateral radiculitis involving mainly the end portions of the sciatic nerve. The hypo-active knee jerk on the affected side, however, suggested early cord involvement. In the third patient, the radiculitis was confined to the lower spinal nerves.

Both of these patients, but particularly the last, showed neurological signs suggestive of early tabes. It has been accepted for many years that the initial lesion in tabes is extramedullary. Nageotte[13] described such lesions in the posterior nerve roots. The degeneration of the posterior column is interpreted as a secondary manifestation. Richter,[14] in recent years, confirmed these observations and claimed to have demonstrated *Spirocheta pallida* in the affected roots. Adie[15] found that the tabetic reaction is mainly fibroblastic and differs distinctly from that in syphilitic meningitis. We can assume, therefore, that in these last two patients the radiculitis was a manifestation of early, clinically not distinct, tabes. The nerve pains were not characteristic of tabes.

Motor weakness was not clearly demonstrated in any of these patients. Muscle wasting was also absent. True sensory disturbances could not be demonstrated objectively, although all three patients gave a history of paresthesias. These were confined to the areas of distribution of the affected nerves.

The spinal fluid was abnormal in all three patients. This is a most important fact. It is evident that if the spinal fluid had not been examined in the last two patients the underlying disease process would have remained unrecognized. Whereas, in the third patient, the physical examination revealed some evidences of central nervous system disease, in the second patient the only abnormality was an inequality of the knee jerks. In this patient, therefore, a spinal puncture did not seem very necessary. However, if it had not been done, his syphilitic infection would have remained unrecognized. In all three cases the spinal fluid showed slight pleocytosis, an increase in the globulin content, and a colloidal mastic curve which varied from the paretic to the meningitic type. These spinal fluid findings have been recorded in most of the cases (90 per cent) reported in the literature in recent years.

Improvement has been rapid following antisyphilitic treatment.

SUMMARY

Three cases of syphilitic radiculitis are reported. The blood Wassermann test was negative in two. The importance of examination of the spinal fluid in all obscure cases of nerve pain is stressed. All three patients showed rapid symptomatic improvement following antisyphilitic treatment.

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DISCUSSION (*Abstract*)

Dr. T. W. Murrell, Richmond, Va.—The question arises as to whether, in the condition under discussion, we are dealing with tabes dorsalis or isolated lesions of the peripheral nerves. I feel that these cases represent examples of syphilitic involvement of the posterior root nerves. Many syphilitic lesions without involvement of the central nervous system go unobserved unless complete studies are made, including an examination of the spinal fluid.

Dr. Hugh Morgan, Nashville, Tenn.—I disagree with Dr. Murrell's statement that we can be perfectly sure that the cases discussed by Dr. Hansen-Pruss did not have central nervous system involvement. Tabes dorsalis may be masked and give occasionally the picture of peripheral nerve lesions. I should be very glad to hear what Dr. Hansen-Pruss has to say in this regard. A paper of this sort is extremely important in focusing our attention on the various nerve lesions found in syphilis, some of which may go unrecognized unless various studies, including lumbar puncture, are done.

Dr. Fred D. Weidman, Philadelphia, Pa.—While it may not be quite germane to Dr. Hansen-Pruss's paper, I should like to call attention to the occasional development of zoster as a result of syphilitic radiculitis. Dr. Spiller, the eminent neurologist, agreed with us that this was the most likely explanation of two cases of facial zoster which had a geniculate ganglion distribution. It was surmised that the patients had a syphilitic pachymeningitis, with extension along the sheaths of the nerve roots to the geniculate ganglion.

Dr. Samuel F. Rosen, Savannah, Ga.—I wish to report a case of herpes zoster that occurred on the chest of a middle aged woman. A marked intercostal neuritis followed and persisted for almost a year. She was eventually shown to have a positive Wassermann reaction and rapidly improved on iodides by mouth and intramuscular injections of a bismuth preparation.

Dr. Hansen-Pruss (closing).—The occurrence of syphilitic radiculitis has undoubtedly been recognized for many years. There is no doubt that the first case of the series was one of combined central nervous system syphilis and ganglionitis. The case of the man with the abnormal pupillary response and abnormal knee jerks could well be considered one of early tabes; but even in this man, the outstanding symptom was referable to involvement of the posterior root nerves. I should like to make a plea for the study of the cerebrospinal fluid in every individual with obscure neurological manifestations, regardless of the blood Wassermann reaction. This seems to me particularly important in view of the excellent therapeutic results following antisyphilitic treatment in the cases which have been discussed in the literature which could be attributed to syphilitic involvement of the posterior root nerve complex.

ACUTE HEMORRHAGIC MENINGO-ENCEPHALITIS*

By JOSEPH E. HIRSH, M.D.,
Birmingham, Ala.

I wish to show a group of patients presenting a symptom-complex which is most unusual and extremely interesting.

Case 1.—E. P. F., a white man, aged 63, was admitted to the hospital February 18, 1931. The patient had a severe case of influenza a month before entrance into the hospital, but had made an uneventful recovery and was getting along splendidly until February 14. He awakened that morning with a severe headache, but went to town about 9:00 a. m. That night he failed to return home and the family, in searching for him, found him at the police station in an unconscious condition. The police informed his wife that he was found in this state in a stranger's parked automobile and was arrested on a charge of drunkenness. No alcohol was detected on the patient's breath and he was taken home and placed under the care of his family physician. On examination, his pulse was 82, blood pressure 145/80, temperature 99.5, and respiratory rate 18. Other than this, the examination was negative, except for pupils which reacted sluggishly to light. The patient could be aroused to take nourishment, but immediately lapsed into a stupor, which appeared to be a perfectly normal sleep. The patient was in this condition when I saw him four days later. In addition, on closer questioning and examinations, the following negative findings were elicited. Let me digress a moment in this report in order to save time, to say that these same tests were made on each of the seven cases reported, and they were negative in every one, except where otherwise specified.

Past medical history, family history and social history were negative.

Fundus examination, x-ray of the skull, urinalysis, blood chemistry, blood spinal culture, blood Wassermann and spinal Wassermann were negative.

Hemoglobin was 80 per cent. Red cells were 4,000,000, white cells 15,950, polymorphonuclears 82 per cent, lymphocytes 13 per cent, and large mononuclears 5 per cent.

The spinal fluid was under greatly increased pressure and was bloody. While the blood in the fluid discounted the result as regards the sugar content of the fluid, it ranged from 58 to 48 (58-58-56-52-49-48-48), descending gradually as the color of the fluid cleared. A lumbar puncture was made each day and the patient slowly cleared mentally, being discharged on March 15, 1931.

Case 2.—Mrs. G. G., a white woman, age 39, was admitted to the hospital June 2, 1931. She had been perfectly healthy and was preparing lunch on the morning of her admission, when she had a sudden occipital headache. She fell to the floor unconscious and remained in this state for about thirty minutes.

*Presented in General Clinical Session, Southern Medical Association, Twenty-Sixth Annual Meeting, Birmingham, Alabama, November 15-18, 1932.

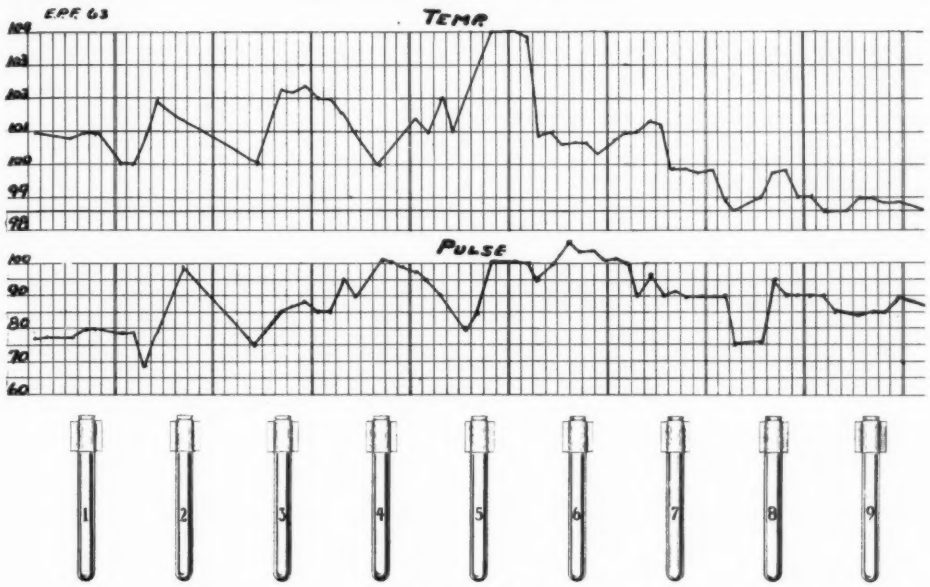

Chart 1, Case 1 (E.P.F.)

Tube No. 1, spinal tap, first day, dark red.
Tube No. 2, spinal tap, second day, lighter red.
Tube No. 3, spinal tap, third day, rose.
Tube No. 4, spinal tap, fourth day, salmon.
Tube No. 5, spinal tap, fifth day, pink.
Tube No. 6, spinal tap, sixth day, yellow.
Tube No. 7, spinal tap, seventh day, straw.
Tube No. 8, spinal tap, eighth day, light straw.
Tube No. 9, spinal tap, ninth day, clear.

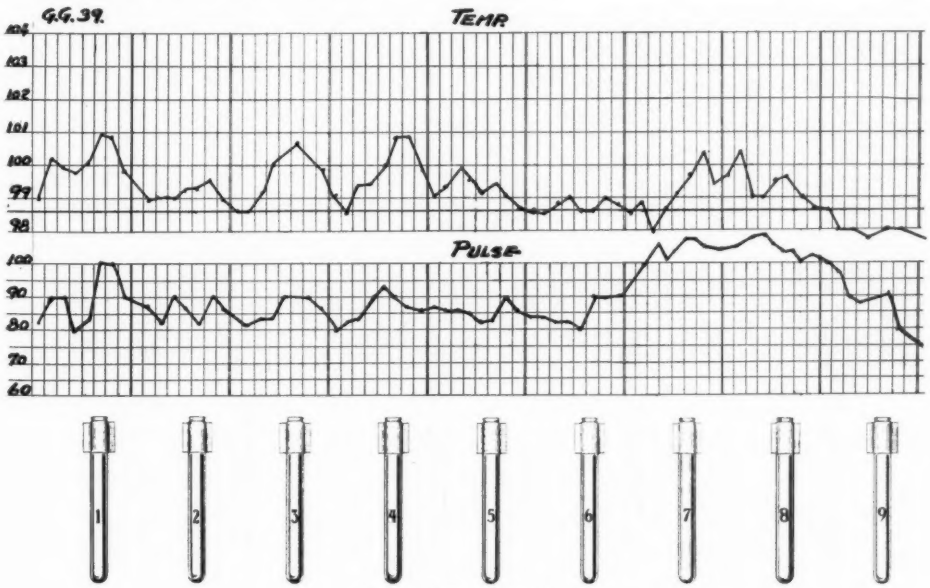

Chart 2, Case 2 (Mrs.G.G.)

Tube No. 1, spinal tap, first day, carmine.
Tube No. 2, spinal tap, second day, lighter red.
Tube No. 3, spinal tap, third day, rose.
Tube No. 4, spinal tap, fourth day, salmon.
Tube No. 5, spinal tap, fifth day, pink.
Tube No. 6, spinal tap, sixth day, amber.
Tube No. 7, spinal tap, seventh day, buff.
Tube No. 8, spinal tap, eighth day, straw.
Tube No. 9, spinal tap, ninth day, clear.

She then roused up sufficiently to answer questions, but immediately lapsed into a stupor.

Physical examination was negative. Blood pressure was 125/80.

The fundi were negative. Pulse rate was 82 and respiratory rate 19.

The Wassermann was negative. Hemoglobin was 92 per cent. Red cells were 4,630,000, white cells 16,400, polymorphonuclears 95 per cent, lymphocytes 5 per cent.

Blood chemistry, blood culture and spinal fluid culture were negative.

The spinal fluid was under increased pressure and very bloody. The spinal fluid sugar ranged from 75 to 47 (75-68-68-65-58-55-47).

The patient was tapped each day and after about 10 days she gradually came out of her stuporous condition and was discharged June 17.

Case 3.—Mrs. A. R. T., a white woman, aged 59, was admitted to the hospital March 3, 1930. The patient was preparing breakfast when she suddenly fell unconscious and was taken to the hospital. Except for a suggestive Kernig sign bilaterally and diminished patellar reflexes, the examination was negative. Blood pressure was 155/90. Pulse was 84 and respiratory rate 21.

The fundi were negative.

Hemoglobin was 85, red cells were 4,520,000, white cells 14,850, polymorphonuclears were 79, and lymphocytes 21. The Wassermann and all other laboratory tests were negative.

The urine on admission showed 4 plus sugar and the blood sugar was 150. Both of these tests became normal after 48 hours and it was assumed that there had been hemorrhage into the fourth ventricle. The spinal fluid was bloody and under increased pressure. This gradually cleared, as daily lumbar punctures were done, and the patient left the hospital in excellent condition March 10.

Case 4.—Mrs. J. A. D., a white woman, aged 58, was admitted to the hospital March 23, 1931. The day before admission she was suddenly seized with a severe occipital headache, accompanied by difficulty in articulation. After a few hours the patient became very drowsy and soon lapsed into a stupor.

Examination was negative. Blood pressure was 138/82, pulse 82 and respiratory rate 20.

The fundi were negative.

Hemoglobin was 85 per cent, red cells were 4,500,000, white cells 14,000, polymorphonuclears 79 per cent, lymphocytes 13 per cent, mononuclears 5 per cent, and basophils 5 per cent. The Wassermann was negative.

The spinal fluid was bloody and greatly increased in pressure. This finally cleared up simultaneously with a return of the patient's normal mentality and she left the hospital on April 5, 1931, but died of a subsequent pneumonia four months later.

Case 5.—Mrs. E. C., a white woman, aged 68, was in good health until she became ill suddenly, complaining of intense pain in the vertex and occipital region of the head, accompanied by nausea and followed by lethargy. She was admitted to the hospital in a deep stupor August 5, 1931.

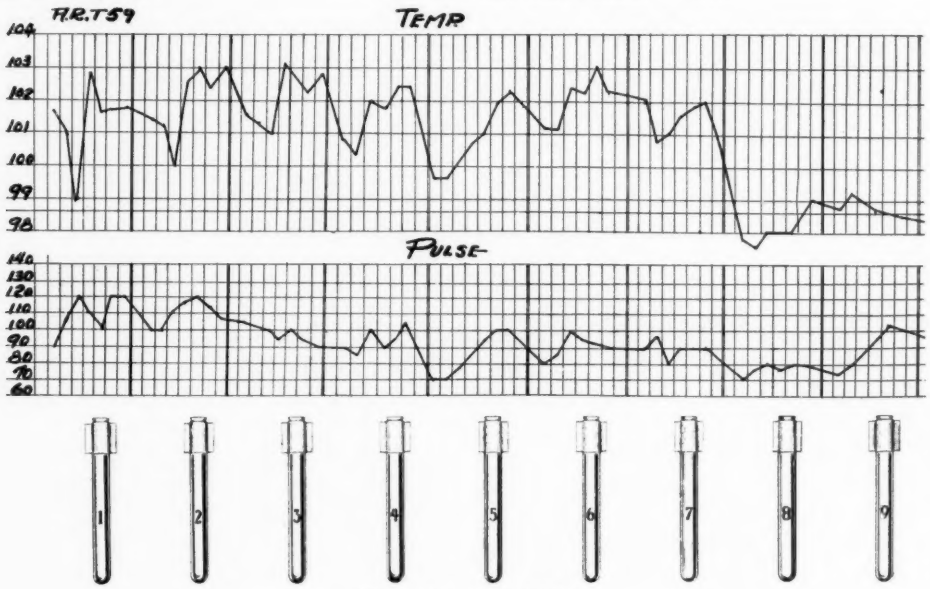

Chart 3. Case 3 (Mrs.A.R.T.)

Tube No. 1, spinal tap, first day, dark red.
Tube No. 2, spinal tap, second day, crimson.
Tube No. 3, spinal tap, third day, rose.
Tube No. 4, spinal tap, fourth day, pink.
Tube No. 5, spinal tap, fifth day, amber.
Tube No. 6, spinal tap, sixth day, amber.
Tube No. 7, spinal tap, seventh day, buff.
Tube No. 8, spinal tap, eighth day, straw.
Tube No. 9, spinal tap, ninth day, clear.

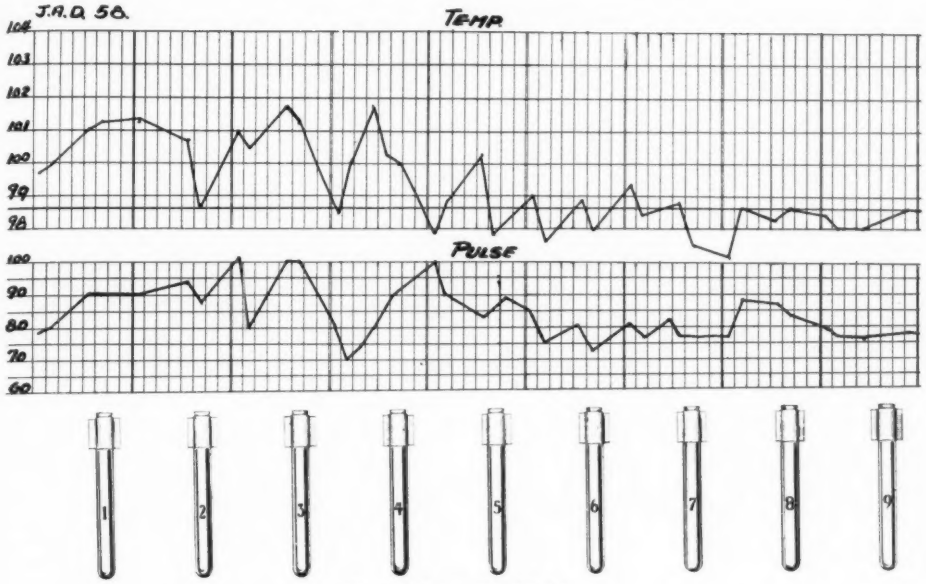

Chart 4, Case 4 (Mrs.J.A.D.)

Tube No. 1, spinal tap, first day, deep red.
Tube No. 2, spinal tap, second day, lighter red.
Tube No. 3, spinal tap, third day, rose.
Tube No. 4, spinal tap, fourth day, pink.
Tube No. 5, spinal tap, fifth day, flesh.
Tube No. 6, spinal tap, sixth day, amber.
Tube No. 7, spinal tap, seventh day, straw.
Tube No. 8, spinal tap, eighth day, light straw.
Tube No. 9, spinal tap, ninth day, clear.

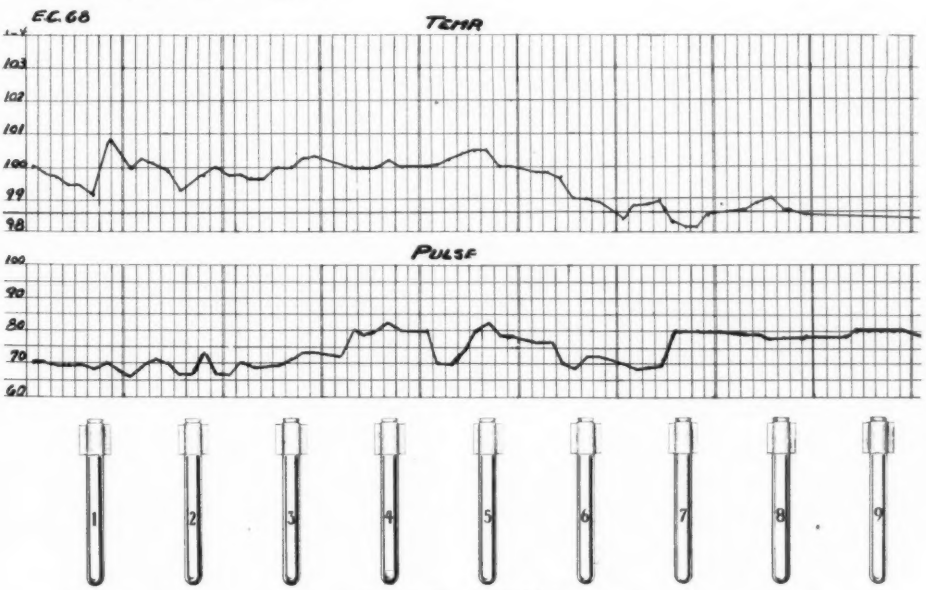

Chart 5, Case 5 (Mrs.E.C.)

Tube No. 1, spinal tap, first day, carmine.
Tube No. 2, spinal tap, second day, crimson.
Tube No. 3, spinal tap, third day, rose.
Tube No. 4, spinal tap, fourth day, pink.
Tube No. 5, spinal tap, fifth day, pink.
Tube No. 6, spinal tap, sixth day, amber.
Tube No. 7, spinal tap, seventh day, buff.
Tube No. 8, spinal tap, eighth day, straw.
Tube No. 9, spinal tap, ninth day, clear.

Examination was negative except for diminished patellar reflexes and a bilateral Babinski. Her blood pressure was 140/80 and pulse 80.

The fundi were negative.

Hemoglobin was 80 per cent, red cells were 4,200,000, white cells 18,500, polymorphonuclears 84, and lymphocytes 16. The Wassermann was negative. All other laboratory tests were negative.

The spinal fluid was under greatly increased pressure and was very bloody. Its sugar content was 88.

With daily tappings, the fluid gradually cleared and the patient's mentality improved. She was discharged August 17, 1931.

Case 6.—J. W. S., a white man, aged 50, was admitted to the hospital September 10, 1931. He had been driving his car accompanied by a friend, when he suddenly ran off the road. The friend spoke to him, but received no answer. He immediately began to vomit and then became stuporous and remained in this condition for several days after admission. The patient had had influenza a year previous to this admission.

Physical examination was negative. Blood pressure was 138/78, pulse 80, and respiratory rate 18.

The fundi were negative.

Hemoglobin was 90 per cent, red cells were 4,990,000, white cells 11,350, polymorphonuclears 78 per cent, and lymphocytes 22 per cent. The Wassermann was negative. All other laboratory tests were negative. The patient was discharged September 21, 1931.

Case 7.—N. R. G., a white man, aged 29, was driving his car on October 6, 1931, with a companion beside him. The latter noticed the car swerve and turned to speak to the patient. He found the patient unconscious with his head resting on his chest. He was immediately taken to the hospital, where an examination revealed only a suggestive Kernig and diminished patellar and biceps reflexes. The fundi were negative.

The urine on admission showed 4 plus sugar and the blood sugar was 149. Both of these became normal after 48 hours and it was assumed that a hemorrhage had occurred into the fourth ventricle as in *Case 3.*

Hemoglobin was 92 per cent, red cells were 4,300,000, white cells 15,850, polymorphonuclears 89, and lymphocytes 11. The Wassermann and all other laboratory tests were negative.

The spinal fluid was bloody and under greatly increased pressure. The patient, as in all previous cases, remained in a stupor for several days, rousing for nourishment and to answer questions and then lapsing into a lethargic state.

Eight days after admission, when the spinal fluid was almost clear, the patient suddenly developed a complete left hemiplegia. While the face had completely cleared when the patient left the hospital November 2, 1931, I understand that he has regained only partial use of his arm and leg and that he has occasional attacks of Jacksonian epilepsy.

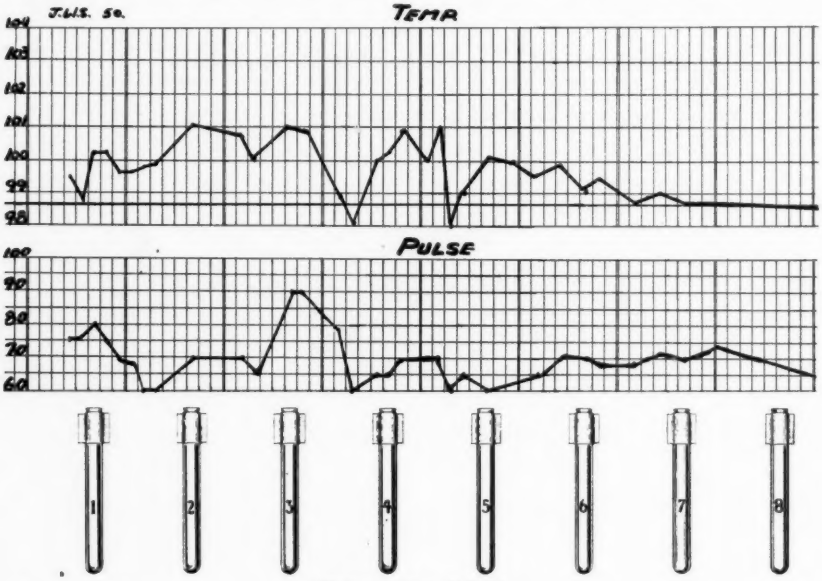

Chart 6, Case 6 (J.W.S.)

Tube No. 1, spinal tap, first day, deep red.
Tube No. 2, spinal tap, second day, crimson.
Tube No. 3, spinal tap, third day, rose.
Tube No. 4, spinal tap, fourth day, salmon.
Tube No. 5, spinal tap, fifth day, pink.
Tube No. 6, spinal tap, sixth day, amber.
Tube No. 7, spinal tap, seventh day, straw.
Tube No. 8, spinal tap, eighth day, clear.

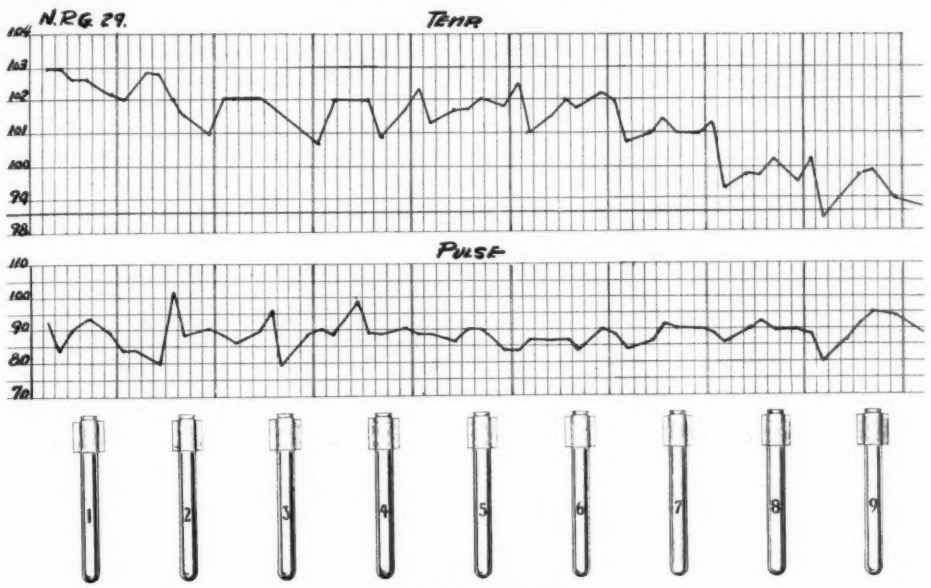

Chart 7, Case 7 (N.R.G.)

Tube No. 1, spinal tap, first day, deep red.
Tube No. 2, spinal tap, second day, lighter red.
Tube No. 3, spinal tap, third day, rose.
Tube No. 4, spinal tap, fourth day, pink.
Tube No. 5, spinal tap, fifth day, yellow.
Tube No. 6, spinal tap, sixth day, buff.
Tube No. 7, spinal tap, seventh day, buff.
Tube No. 8, spinal tap, eighth day, straw.
Tube No. 9, spinal tap, ninth day, clear.

DISCUSSION

It is with a certain feeling of hesitation that I present these cases under the title of acute hemorrhagic meningo-encephalitis. I am fully cognizant of the fact that many physicians do not regard this group of cases as encephalitis in the true sense of the word.

The literature is replete with reports of hemorrhagic encephalitis, but most of the reported cases followed the intravenous administration of neoarsphenamine. Among these are reports by Ehrlich,[1] Sen,[2] Gjessing,[3] McBride,[4] Sanphar,[5] Castello,[6] Fraser,[7] Dennie[8] and Milian, the last of whom applied the name "serous apoplexy" to the condition.

The pathology in such cases consists of extreme congestion of the cerebral meninges, serous exudation and multiple punctate hemorrhages in the meninges and brain substance, the greatest amount of degeneration being in the substantia nigra, according to McKinley and Gowan.

The discoloration of the spinal fluid is erythrochromia, the fluid consisting of numerous red and white blood cells, and a very small amount of globulin without marked coagulation. This is in contrast to the xanthrochromia of the Nonne-Froin syndrome, in which the amber fluid is constant, there is a large amount of globulin, pleocytosis is prominent, and coagulation occurs as soon as the fluid is withdrawn.

Ehrlich[9] believes that the lesions of hemorrhagic encephalitis and their attendant symptoms are produced by oxidation products; Dudley[10] believes the condition is caused by insufficient oxygen supply to the tissues, while McDonagh[11] believes the responsible agent is a toxin liberated by the spirochete of the vasoconstrictor nerves.

As none of our cases was luetic and none had specific treatment, these theories as to etiology must be discounted.

If these are not true cases of hemorrhagic encephalitis, what then? Spontaneous meningeal bleeding is frequently secondary to ruptured aneurysms of the vessels at the base of the brain, especially those of the circle of Willis. These aneurysms occur in a congenitally weakened vessel or one weakened by arteriosclerosis, syphilis, bacterial infection, or trauma.

In 1868, Charcot concluded that miliary

aneurysms were the cause of bleeding in every one of 79 cases of spontaneous cerebral hemorrhage reviewed by him. Ellis, in reporting a group of such cases in 1909, indicated that arteriosclerosis was the responsible factor. However, the report of 20 cases by Neal in which the average age of the patient was 20, and 114 cases by Symonds, in which the average age was 30, argues against this. What of lues as the etiological agent? Fearnsides collected only 44 cases of cerebral aneurysm in 5,432 autopsies on the brain and concluded from his masterful study that lues was not the cause of intracranial aneurysm.

Are these cases of ruptured cerebral aneurysm? In this condition, the hemorrhage is usually massive, the spinal fluid, taken several days after the attack, is the amber Froin type, there are definite localizing signs, and finally, the case usually proves fatal.

Therefore, we conclude that this group of cases may be classified as cases of acute hemorrhagic meningo-encephalitis, the etiological factor being unknown, perhaps a filterable virus as suggested by Mallowitz or a streptococcus with selective action for the central nervous system as suggested by Rosenow.

What of the treatment? Wilkerson[12] reports a case cured by intravenous mercurochrome, while McBride[13] and Lasersohn[14] each reports cases cured by intravenous sodium thiosulphate. Whether or not these agents proved efficacious is questionable, as all of our cases recovered from the immediate attack and received nothing but symptomatic care and daily spinal drainage, either by the lumbar or cisternal route.

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Medical Arts Building

MENACE OF THE COMMON COLD*

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The average cold is common only because of its prevalence; it is uncommonly dangerous otherwise. During the last five years its menace has provoked the tardy interest of the medical man, the business man and the average citizen. The medical man is at present awake only in highly specialized fields, after considerable prodding. Witness the gift of $195,000 several years ago by the Chemical Foundation to the Johns Hopkins University School of Hygiene and Public Health for a comprehensive investigation of the origin, nature, and possible cure of the common cold; and recently the gift of $45,000 from the Rockefeller Institute to Columbia University to finance continued research on the common cold. The specialist in the allergic field, the nose and throat man, the pediatrist are all interested: the average medical man not at all. Until the general practitioner takes the common cold seriously, little can be done along educational lines. Wall Street is certainly interested, for statisticians tell us that most of us average three colds during the year, and that the cost to industry annually is about $450,000,000, or roughly 90,000,000 working days. These figures are taken from only 42,000,000 workers, not our population *in toto,* and I believe do not include drug bills and doctors' bills. Main Street is not at all interested and will become so only after a long educational campaign has been successfully waged as with tuberculosis. The average citizen takes seriously a blazing waste-paper basket because he realizes that if he does not do so his home will soon be wrapped in flames that no water can quench. As soon as he realizes that the common cold is the waste-paper basket on fire and that an infection in the nose and throat of himself or any member of his family may mean serious illness with its attendant anxiety and expense, then, and only then, will educational endeavor begin to bear fruit.

Layman as well as physician should realize that the areas of head and chest lined with mucous membrane melt continuously and imperceptibly into one another as do the rooms and halls of a home; and that it is but a step from rhinitis to

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sinusitis, otitis media and mastoiditis, and from laryngitis to bronchitis and bronchopneumonia. In concluding these introductory observations, let me emphasize this fact: gastro-intestinal infections in the past fifteen years have been steadily on the decrease throughout the South at any rate. I now see only one case of infectious diarrhea to the twelve that I used to see ten years ago. Cholera infantum is only an historical disease to the modern pediatrist. On the other hand, infections of the upper respiratory tract are markedly on the increase throughout the balmy South, particularly since the Great War. Several years ago Brenneman referred to the fact that 90 per cent or more of his winter practice dealt with infections of mucous membranes in children. I believe that the majority of us could make a similar statement. To my generation of childhood, some 40 years ago, otitis media and sinusitis were practically unknown disease entities; on the other hand, all three of my children had otitis between the ages of one and five years, and I know of very few modern children who have not had a similar experience. With these infections on the increase and accompanied by complications that maim or slay, what is the medical profession going to do about it?

ETIOLOGY

(A) *Bacterial Factors.*—Some very interesting studies have been made recently in this direction. Dochez and his co-workers[1], using the chicken embryo as a culture medium, have demonstrated the following facts. Saline washing from the mouths and nares of the victims of a natural cold, bacteria-free after passage through porcelain filters have produced typical common colds in chimpanzees for fifteen or more generations. It has been possible to pass on this artificial cold from monkey to man and back to monkey. Their results have been confirmed by other laboratory workers.[2] Let us consider the following points:

(1) A common cold can be produced by an agent unknown to man and as yet not isolated as a demonstrable object; hence the significant term, "a filtrable virus."

Is it really something new in the etiological field of man's diseases?

Are we on the threshold of some astounding discoveries dealing with causative factors not dressed as usual in the form of coccus, bacillus or spirillum?

Will subsequent investigations prove that the filtrable virus is merely an enzyme?

"Yes" to the last question would be too vague and improbable an answer and is denied by further study. As a matter of fact, we are all probably more or less familiar with Pasteur's classical and beneficent experiments on the filtrable virus of rabies. Ivanowsky,[3] in studying mosaic diseases of tobacco, first gave the filtrable virus a reputable standing in the bacteriological world. As far as we know at the present time, rabies, measles, small pox, mumps, dengue, anterior poliomyelitis are all caused by a filtrable virus. There are other diseases as well that fall into this class, but the ones I mention are the leaders. In the last analysis the modern bacteriologist is still knocking at the same unopened door that confronted Pasteur many years ago.

(2) The transmission of this cold-producing agent through fifteen hosts produces such tremendous dilution of the original culture that one must suppose a multiplication of the new agent in amount or potency on its embryonic medium.

(3) During the passage of this infection through monkeys, Dochez observed increasing activity on the part of the known pathogens such as the *Streptococcus hemolyticus, Hemophilus influenzae* and the pneumococcus.

The results of other investigators are largely of value for negative reasons.

In a study of filter-passing anaerobes Noble and Brainard[4], using 14 persons with common colds and 11 normals obtained negative results. Of 114 strains investigated, they found many gram-negative filter passing anaerobes innocuous to rabbits. Falk, Harrison, McKinney and Stappy[5] were unsuccessful in experiments conducted with the *Hemophilus influenzae*. They did succeed in transmitting a type of common cold to monkeys, and they refer to certain pleomorphic streptococci and closely related diplococci commonly found in these induced infections. Serologic studies on the blood collected from 50 post influenzal human cases demonstrated in definite concentration the presence of agglutinins against the pleomorphic streptococci and dip'ococci previously referred to. Their report has not been substantiated. Webster and Clow[6] made the following significant observations in studies of the *Streptococcus hemolyticus, Hemophilus influenzae* and pneumococcus. Persons free of these germs were usually free of coryza, influenza and sinus attacks. Periodic carriers free in health show these organisms when ill. Chronic carriers show increased numbers in acute illness. Resistance of carriers to attacks, number of contacts and inhospitable weather conditions dictate the prevalence of these infections in the average community.

In this connection one might note that Kneeland[7] found the upper respiratory tract sterile at birth. In two weeks nasal flora of the adult type was in evidence,

but there were no potential pathogens. At 8 months of age the infant's nose and throat are entirely similar in bacterial flora to the adult. Kneeland also found no evidence of any definite and specific agents in the first colds of infancy.

To sum up these bacterial studies which I have just quoted, one is tempted to believe that the filtrable virus paves the way for the menacing activity of the deadly pathogens. Possibly the common cold would be a simple affair if, for example, it did not furnish a good landing field for a virulent streptococcus.

The bacteriologist will eventually help us greatly as he has in the past. At present when he calmly refers to some five hundred strains of the streptococcus he hurls the proverbial monkey wrench into the thinking machinery of the average clinician. Are many of our well-known organisms not only pleomorphic but also heteromorphic? Can the same organism change not only its shape but its ability to produce varying disease-complexes as we know them? Possibly some day an ingenious bacteriologist will still further confuse us by juggling together cocci and bacilli in Burbank fashion to produce hideous and unrecognizable hybrids.

(B) *Accessory Factors.*—(1) Physical debility is mentioned only in passing and for the sake of accuracy.

(2) *Inherited Tendencies.*—There is no doubt about the fact that in certain families without rhyme or reason infections of mucous membranes are annoyingly prevalent. I have frequently observed in certain family groups a predilection for diseased adenoids and tonsils. Of course it is conceivable that certain organisms are preying upon this particular family group. Follicular tonsillitis is supposedly non-contagious, but in my army days I once had under my care a series of some 200 typical cases.

(3) *Allergy.*—There is nothing more confusing in pediatrics than the allergic case with its mixed infections of mucous membranes. It is a question to my mind whether the pure allergic case ever really exists in childhood after six months of hay fever and asthma.

(4) *Temperature Changes.*[8]—Colds are certainly worse when the weather changes as in fall and spring and are much more prevalent in cold weather. Why? A lowering of local resistance in the upper respiratory tract with a steady increase in virulent carriers? Crowded housing conditions? A confusing epidemiological fact is that the peak of incidence is often the same whether the locality is Florida or Washington.

(5) *Drafts.*—In a study of vasomotor reactions Winslow and Greenberg[9] found no difference between the localized draft and uniform body chilling. An error in their studies to my mind is that a draft is purely a personal equation. A current of cold air sweeping across the floor is pleasant or insensible to Mr. Smith, but not to Mr. Brown. A current of air can also be pleasant to Mr. Brown at one time and not so at another time. Because of a juxtaposition of physiological factors, a current of air produces on the specific individual a distinct feeling of lack of ease or discomfort and even that indefinable sensation of "taking cold." Such a current of air has then become a draft in so far as one or more specific individuals are concerned. I do not understand why an electric fan at night is enjoyed by my wife and gives me a pain in the shoulder or an exacerbation of a chronic sinus. It is a clinical fact, nevertheless.

(6) *Lack of Vitamins.*—The influence of vitamin deficiency in production of colds is not substantiated by experimental studies on infant groups.[10 11]

(7) *Diet and Clothing.*—Both accessory etiological factors are open to further study. I believe that the child who eats little eggs and meats and enjoys a quantity of fruits and vegetables is less susceptible to colds. In the line of clothing, children under my care in South Georgia wear nothing on the head in summer or winter. With light basic garments such as cotton underwear, cotton socks and low shoes, the changeable weather conditions are met with readily removable outer clothing such as blanket squares and flannel wraps in the infant, sweaters and coats on the older child. The child who is throwing off heavy bed-clothes all night long, or who is itching and sweating in heavy woolen underwear, is certainly more likely to contract the common cold.

(C) *Obscure Factors.*—Certain biochemical or metabolic factors which are not readily understood perhaps influence the susceptibility to colds. Clinically we recognize croup as a possible dietetic disorder. Though it has received little investigation by the biochemist, we recognize the close connection between acidosis and certain types of infections in the upper respiratory tract.

Why is the puffy, hydrolabile child affected with eczema and subject to colds? In gout, con-

junctivitis and bronchitis are recognizable and often unpleasant complications.

Before discussing the preventive therapy three important conditions should be eliminated.

(1) Infected adenoids and tonsils.

(2) Sinusitis.

(3) Allergic manifestations.

The allergic cold is not easily dismissed by the average clinician, and seems to me quite often the most difficult problem to contend with, particularly when the cold is both allergic and infectious. Certain differential points emphasized by Cohen and Rudolph[12] are at times quite helpful. In allergy attacks are recurrent rather than single, often related to heredity, not contagious, with itching, sneezing or wheezing as suggestive symptoms. In addition, in allergy mucous membranes are often pale and edematous rather than hyperemic: the discharge is mucoid rather than mucopurulent and often shows 10 per cent or more eosinophils rather than polymorphonuclear cells.

An educational campaign planned by the American Medical Association against the common cold would be a praiseworthy proceeding. We need a league against the common cold just as much at the present time as we need a league against tuberculosis. Within the limits of this short paper a minute discussion of therapy is out of the question and possibly unnecessary. The best preventives I know at the present time are largely dietetic and hygienic proceedings with a reasonable avoidance of the afflicted individual. Stock vaccines among factory workers[13] have produced indifferent results and the medical profession at large puts scant faith in their use.[14] The autogenous vaccine is more helpful, but at times beyond the pocketbook of the average sufferer. Mixed vaccines from the florid colds of ten or twelve children to be obtained and used during the seasons of marked infectivity I shall experiment with this winter. In early childhood the great majority of common colds begin in the nasal passages. There are two important indications:

(1) Check the spread of the infection.

(2) Achieve free drainage.

Apparently at the present time the use of a synthetic silver salt dropped into the nares produces the best results in checking the disease. If the mucous membranes of the nasal cavities and the turbinates are markedly swollen and hyperemic, the child suffers from headache, difficulty in breathing, and sleeps badly. In addition, the danger of otitis and sinusitis becomes very real. Under these conditions the use of an ephedrine solution is distinctly indicated. The most valuable general procedures in the average household are abundant fruit juices, confinement to bed in a warm but well ventilated room, and isolation.

It is estimated that less than one-half of 1 per cent of human beings will accept the medical advice of going to bed, and I know of no human being who will really practice isolation in so far as the common cold is concerned.

The common cold is a very real problem which I feel at the present time we are accepting too lightly. A league against the common cold is not a bizarre suggestion. I feel that an educational campaign should be initiated by organized medicine in this country. It would be humiliating to wait until the issue is forced upon us by an intelligent and well-informed laity. The subject is a matter of nation-wide importance.

DeRenne Apartments

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THE OBLIGATIONS AND RESPONSIBILITIES OF THE SURGEON*

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Some twelve years ago, in his Presidential Address before the American Surgical Association, the speaker discussed "The Opportunities and Responsibilities of the Surgeon." In that address, he laid especial emphasis upon the great opportunities that were then presenting to the surgeon, in the first place, by reason of his membership in the honorable guild of surgeons and all that that implies, and, secondly, because of the great advances that were continually being made in scientific medicine. Attention was also called to the fact that along with these opportunities went, *pari passu*, certain responsibilities; that the two were intimately correlated. While the opportunities offered to the surgeon today are, if possible, greater and more intriguing than those of ten years ago, the obligations are correspondingly greater. One cannot increase without affecting the other. This morning your attention will be directed briefly to the obligations that belong to the surgeon by reason of the position of peculiar responsibility that he occupies in the social order.

As a surgeon advances in years and experience, the obligations of his profession are apt to loom larger, and the responsibilities to weigh heavier, while the opportunities, great as they are, do not excite quite so keen an interest, perhaps, as formerly. This general statement may not meet with universal acceptance, since some individuals never seem to grow old, retaining their youthful outlook indefinitely. The late Dr. W. W. Keen, of Philadelphia, Dr. W. H. Welch, of Baltimore, and our own Dr. Rudolph Matas, of New Orleans, are striking examples of the truthfulness of this observation. But, generally speaking, it is true that with added years come increasing caution and a fuller sense of obligation and responsibility than obtained in one's earlier years. This is probably due to a fuller knowledge and understanding upon the part of the surgeon of just what a surgical operation really means, in all of its implications, to both patient and surgeon. One recognizes more fully that his license to practice surgery upon his fellows entails upon the surgeon certain responsibilities that he cannot shirk, certain obligations that he is bound to respect, and that he will surely wish to respect, if he is made of the sterling stuff out of which all true surgeons are made. As he grows in experience and wisdom and becomes more familiar with disease manifestations and their wide-reaching effects upon the physical, mental, moral and spiritual well being of mankind, he cannot fail to be more and more impressed, at times even oppressed, with his ever-increasing obligations to his fellows and to society in return for what his profession and society have done for him. A realization of this fact upon the part of the conscientious surgeon cannot fail to have a sobering effect; to make him increasingly more careful, lest he prove unfaithful to the trust imposed in him and unworthy of his high calling.

We shall consider the obligations and responsibilities that surgery imposes upon those who practice it under five headings, and shall endeavor to analyze briefly just what modern surgery implies with regard to the patient, to the immediate family, to society in general, to the profession, and to the surgeon himself.

It will at once be apparent that the contract that we have undertaken is a large one, too large, in fact, to allow, in the limited time allotted to us, other than a very sketchy review of the more important points involved. First, let us look at it from the point of view of the patient. Just here the speaker has the great advantage of having had experience at both ends of the knife, having lost his gallbladder a couple of years ago. I wonder how many of those present have been the subjects of a serious surgical operation. It would be interesting if each one of you who has been operated upon would hold up his hand. Those of you who haven't had this interesting experience have missed a great deal, for let me assure you that unless you have had it, you can never quite get the patient's point of view, no matter how many times you may have been through it as a surgeon. There are certain occurrences that one must actually experience in his own person in order to understand their full significance, and a surgical operation is one of them. Much depends upon at which end of the knife you may happen to be, the handle or the blade; whether you play the active or the passive role in the surgical drama. Having himself played both stellar parts, the speaker has been deeply impressed with the great value that accrues to the surgeon, and, incidentally, to his patients, from such an experience. It is all very well for

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the surgeon to insist that he understands just what it all means from repeated observations upon patients about to undergo it and from hearing them describe their sensations, both before and after, but one can never quite comprehend just what it really means to a nervous patient in the way of mental anxiety, not to say fear, physical discomfort and pain, until he has himself actually gone through such an experience. It may not be the fear of dying, although the thought of that possibility is always present under such circumstances; or the dread of physical suffering; or the loss of consciousness in the case of a general anesthetic; or the loss of time from one's regular occupation; or, in these days of financial depression, the expense involved. It may not be any one of these alone that causes special anxiety, but sure it is that some combinations of these factors will, in the great majority of cases, enter into the picture to such an extent as to cause the prospective patient many anxious moments, and, in certain cases, such an acute state of nervous shock and mental distress as seriously to affect the outcome of the operation. The conscientious surgeon, really interested in his patient's welfare, will not fail to recognize this fact and institute proper measures to overcome it, even at the cost of some inconvenience and loss of time to himself, for he, of all others, can best apply the necessary relief measures.

The busy operator (the term is used advisedly as referring to one interested chiefly, if not solely, in the operative technic) with his daily office hours, his long list of operations and his golf and bridge engagements to keep, will insist that he cannot be bothered with such trivialities, that he has neither the time nor the inclination to talk to the patient about to be operated upon, it may be to answer his, or especialy her, many foolish questions; to explain just what it is intended to do and why, and what are the chances of recovery or of relief from unpleasant symptoms, and thus try to calm his fears and get him in a better frame of mind to go through the trying ordeal of a surgical operation. But the speaker insists that it is just as much the duty of the surgeon to relieve mental apprehension and misapprehension over an anticipated surgical operation as it is to remove physical disabilities or to save life. A surgeon has no more right to cause needless mental distress to a sensitive patient than he has to inflict unnecessary bodily pain, and, if he is a wise surgeon, he will spare no effort to avoid doing so, if for no other reason than for the general effect it will have upon the result of the operation. This basic principle will be brought home more forcibly to the surgeon after he has, in his own person, experienced its effect. There are few circumstances under which the Golden Rule applies with greater force than right here. Let me repeat, most people who have not already been through one have no adequate conception of just what a surgical operation really means. The ideas concerning it in the lay mind are usually distorted and erroneous, based, as they often are, upon exaggerated reports from ignorant persons or those whose imaginations have been allowed to run riot.

It may seem fruitless, perhaps, to spend valuable time in the attempt to free the patient's mind of absurd notions, but, unfortunately, the average patient does not know any better. It is the old story of the dog that does not bite. You may know that he does not bite, and the stranger, prompted by you, may also know it, but the dog himself may not know it, and so the stranger is bitten. You, of course, know that nowadays there is very little danger in taking an anesthetic or in an ordinary surgical operation, and the family and friends may know it, but the average patient does not know it, and consequently suffers much unnecessary mental distress of which we surgeons can and should relieve him if we will only take the necessary time and trouble to explain to him just what it is all about. If this were always done, the speaker feels sure that not only would much needless mental suffering be avoided, but since mind has such a marked effect over matter, the end-results of surgical operations would be materially improved. Every factor that may in any way influence the final result should be carefully considered and, so far as possible, be provided for by the surgeon before undertaking even the simplest operative procedure. The need for this extraordinary care will be well understood by every surgeon of experience. Who cannot recall instances that have occurred in his own practice or that of a colleague where some slight surgical procedure has been followed by disastrous results? Experiences such as these impress the thoughtful surgeon with the potentially serious character of his occupation and the necessity for the most scrupulous care in the observance of all the requirements of modern surgery in order to avoid unpleasant experiences, such as those described many years ago by Sir James Paget in his classical essay

entitled "The Calamities of Surgery," which every surgeon should read.

The speaker has dwelt thus at length on the personal obligation of the surgeon to his nervous patient (and who is not nervous and apprehensive under such circumstances?) not only because such consideration is due him upon purely humanitarian grounds, but because of the deleterious effect that disturbed psychic conditions may have upon the convalescence and ultimate result. Many years' experience has taught the speaker that in dealing with people, especially sick people, if you really want to get anywhere, you must travel by the human route; you must take into account the human equation, and you must deal with people as they really are, not as you may think they ought to be.

It goes without saying that the surgeon owes it to his patient to keep abreast of surgical progress by following current literature and by attendance upon clinics and professional gatherings, such as this, in order to insure his patients the benefit of the best that scientific surgery has to offer.

Not the least of the obligations of the surgeon to his patients has to do with his personal as distinguished from his professional relations. These are often of such an intimate and confidential nature as to furnish him the opportunity to act as friend as well as surgical advisor. This happy state of affairs, for such it is, is based upon the feeling of mutual trust and esteem established between surgeon and patient, which, in turn, springs from implicit confidence in the integrity and truthfulness of the surgeon. This brings up the question as to the obligation of the surgeon with regard to telling his patient the whole truth concerning his condition and the nature of his trouble. Opinions differ on this point among surgeons. Some tell their patients the truth under all circumstances, while others do not believe in telling their patients anything disagreeable, thinking that, by so doing, they are not only doing them a kindness, but are helping them physically by withholding from them knowledge of serious trouble. My own personal conviction as to the obligation of the surgeon in this respect is very clear. One need not knock his patient down with a club, so to speak, in telling him bad news. When tactfully done, never has the speaker yet seen a patient who was not grateful for being told the truth, even though it may be the worst thing that you could tell him. There are very few individuals who cannot or will not adjust themselves, as best they can, to circumstances, once they know just what they have to expect. The truth, disagreeable as it may be, is much easier for the average individual to bear than uncertainty and suspense. Even if one tries to do so, it is rarely possible to deceive an intelligent person for long. He will surely find you out sooner or later, and once deceived by you, he will never fully trust you again. Once you have lost your patient's confidence, you have lost the best possible hold that you have on him. From that moment you are discredited and an object of suspicion by the patient, and he, in turn, feels deserted and more miserable than before, because there is no one left to whom to turn whom he can implicitly trust. No, the surgeon will not have fulfilled his obligation to his patient unless he plays fair with him and treats him as an intelligent human being and not as a child. In doing so, the surgeon will often find the patient eager to cooperate in every way, a much more favorable frame of mind in which to undertake a serious surgical procedure than one of distrust and fear. In taking the patient or his family into his confidence, the surgeon need not go into all the gruesome details or the many possibilities that may happen in the course of the proposed operation. It will be sufficient to deal only with the probabilities and not to paint them in too sombre colors. Optimism, not of the foolish sort, is a great asset to the surgeon. It is contagious and will surely infect the patient and his family.

Much of what has been said concerning the surgeon's obligation to his patient applies with equal force to the patient's immediate family and friends. Here again, with many surgeons, it is the custom to give little heed to the family of the patient to be operated upon. They simply will not be bothered with them. However, it should not be forgotten that the relatives and friends of the patient have rights that the careful surgeon will feel obliged to recognize and respect. The patient is, as a rule, and the nearest relative or next friend is always, entitled to know just what it is proposed to do and what, in the opinion of the operating surgeon, are the patient's chances of recovery, both as to life and function. This practice of frankness is desirable from every point of view, especially in case of unforeseen unfavorable developments following the operation, in which case it may well be a source of protection to the surgeon. He who is fully alive to his responsibilities will be careful to neglect no opportunity to safe-

guard the interests either of his patient, the family or himself. After something unfortunate has happened, it is too late to think of the might-have-beens. A great deal of unnecessary worry may thus be saved the anxious husband or wife or father or mother, and only blame can attach to the thoughtless or careless surgeon who neglects to afford them this measure of relief. Incidentally, it may at times constitute a real obligation on the part of the surgeon to protect the patient from the misdirected efforts of his over-anxious or over-zealous family and friends. Many a potentially good result following a surgical operation has been delayed or marred by the butting in, with the best of intentions, by some foolish friend or relative. A few words of explanation as to just what it is hoped to accomplish and in just what way he or she can help bring about the desired result will often convert a possible menace into a valuable ally. I am well aware that much I have been saying is quite elemental, indeed it may seem to some of you to be out of place in an audience composed of surgeons in active practice such as I am addressing, but it is well for us to bear constantly in mind that the elemental things in surgery are, at the same time, fundamental and of vital importance, and that in our work we are dealing with human life, health and happiness, which is quite different from that of any other calling. When a banker or a business man, for instance, who deals with dollars and cents, or their material equivalents, loses out on one deal, he may look forward confidently to recouping his losses, and perhaps more, in the next deal. Not so with us: when we lose out, there may be no come-back, and somebody pays the price, it may be with his life. It is well to remember, too, in our work that we are always playing for the hundredth case, the unusual one, and one never knows just when one is going to meet that case. The ninety and nine will get along all right, either because of or perhaps in spite of our best efforts, but this hundredth case will not infrequently tax our resources to the uttermost, and now and then baffle our every effort for relief or cure. Too sweeping generalizations are always dangerous. What is one man's food may be another's poison.

As every surgeon knows, a surgical operation demands of him personally a great deal more than is involved in the more technical skill of the operator, as important as that may be. It carries with it the obligation on the part of the surgeon to see to it that every factor involved therein has been, in so far as professional knowledge and foresight will allow, anticipated and provided for. It implies a correct diagnosis, or a frank admission that such is not possible, and that the operation is purely exploratory, for diagnostic purposes.

There is a very definite obligation that we, as surgeons, owe to our profession. Its honor and fair fame are in our keeping. What we, as individual surgeons do, whether good or ill, reflects corresponding credit or discredit upon surgery, and this is equally true both of professional and ethical conduct. Let us not forget that every unnecessary operation is a reproach to surgery. Every unsuccessful operation, whatever may be the cause of failure, whether due to the fault of the operating surgeon or not, makes it that much more difficult to convince some people of the efficacy of surgery, and thus tends to create in the popular mind a prejudice against it. So it is with infractions of our code of ethics. Fee splitting and commercialism in all of their various guises, sharp practices of all kinds made use of for purposes of professional gain, are to be condemned in the strongest terms as unworthy of a member of our honorable guild. But perhaps some one may say, why bring up such unpleasant matters as this in a group of surgeons of such high standing for ability and integrity as those who compose the Surgical Section of the Southern Medical Association? My reply is that surgeons are but human, as people go very human, from the nature of their work, and the intimate contact into which it brings them with other human beings in distress. Professional competition is keen; the times are hard; it is difficult to make a decent living and support one's family. The temptation at times is great, and opportunities are not wanting where pecuniary advantage may be gained from practices not in accord with accepted professional standards. In this commercial age we do well, as members of a profession whose proud boast is its idealism and its altruism, to remind ourselves now and then of just what we stand for in our relations with our fellows, both professional and lay, "Lest we forget" and be tempted to barter away our priceless birthright for "a mess of pottage."

There are certain obligations resting upon us surgeons in common with all other educated men to do our full share in restoring society to something like a normal condition from the grave disorders through which it has been passing. May I quote here a few passages from an address given by the speaker soon after the

ending of the World War that are just as true and just as binding today as they were then:

"Social structures have been shaken to their foundations by wars and rumors of wars. Many individuals, groups and organizations of men, comprising in some instances the controlling forces of nations, have temporarily lost their orientation and are foundering in the quagmires of doubt and despair, or are futilely chasing will-o' the-wisps of false doctrines and impractical theories of political economy and government.

"One has but to look around in our own country as well as abroad to see on every hand evidence of social unrest and mutual distrust between classes and nations. The gaunt figures of famine and pestilence are stalking abroad, in some portions of the world almost unopposed. Anarchy and agitation, political and industrial, are here and there to be seen raising their ugly heads. It requires more than the average optimism to enable one to retain his equanimity and to contemplate the future with unshaken confidence.

"This is the situation that confronts us as educated men, members of a profession boastfully proclaimed by some as 'the learned profession,' a profession that has ever stood for the highest and best in human aspirations and relations.

"In a crisis such as confronts us at this moment, to whom is society to turn for aid and guidance? From what other source can a satisfactory solution of its manifold and perplexing problems be found than from its educated, thinking men? We as members of this favored class, to whom much in the way of opportunity has been given, owe much to society in return. In a strictly professional way, we may have fulfilled this responsibility, some perhaps in large measure. But in the still larger sphere of good citizenship, of sharing in the responsibilities of government, of making our influence felt upon the side of civic righteousness, we doctors have, as individuals or as a profession, little to show in the way of accomplishment. We must plead guilty to the charge frequently made against us, namely, lack of interest. In response to a fine professional consciousness over-jealously guarded, perhaps, we have stood too long aloof from active participation in public affairs, and have left to others, not always so disinterested, the management of civic matters of great importance to us as individuals, to the communities in which we live, and to the nation. It is high time for us, as a profession, to forsake our exclusiveness and to enter more actively into public affairs; to make our influence felt in the decision of questions involving the welfare of mankind. There are few civic questions that do not interest us primarily as citizens and in the settlement of which we are not concerned. There is nothing in our code of ethics to prevent active participation by physicians, individually or collectively, in public affairs. May we not re-dedicate ourselves to that greater service and wider influence which is not bounded by a strictly professional horizon, but embraces the larger field of general human endeavor. Physicians and surgeons should exert their moral force by actively interesting themselves in municipal, state, national and international affairs, not casting precedent entirely to the winds, but, on the other hand, not so firmly bound by it as to prevent them from taking their proper place in society and accepting and discharging their full share of the responsibilities of citizenship."

Partly in order to save time, perhaps, and partly because of real or fancied benefit therefrom, the tendency of the present day seems to be toward the use of short cuts to a diagnosis; an exploratory incision; the x-rays; chemical and biological tests and certain of the so-called instruments of precision and to depend upon these instead of the more old-fashioned and, I may add, not infrequently more dependable time-consuming methods of a carefully taken history and thorough physical examination, followed by a painstaking study of the evidence thus obtained. In a paper read before this Association a year ago I called attention to the difficulties in diagnosis presented by certain cases in which the mimicry of the symptoms of one disease by another is so marked as to give rise to great difficulty in their differentiation.

The point that I wish to emphasize is the great importance of arriving at a correct diagnosis wherever possible before a surgical operation is undertaken. A surgical operation, like marriage, is far too serious an undertaking to be entered into under any other conditions than, in the language of the prayer book, "soberly, discreetly, and in the fear of God." One hears the statement made, usually by the unthinking laity, that surgeons after a while become calloused to their responsibilities and obligations. Not so! Quite the contrary! As one grows older and becomes more experienced in the management of surgical cases, one comes to appreciate more and more the gravity of the responsibilities involved. He may acquire a degree of outward calm and poise, after having met and dealt successfully with many grave emergencies, but these experiences have but served to show him how serious, as well as how satisfactory, the consequences may be.

Not the least of the surgeon's responsibilities is to determine, sometimes even before a definite diagnosis has been made, whether the clinical picture presented by the patient is such as to require an operation. One of the most important lessons that a surgeon has to learn is when not to operate. Meddlesome surgery is more productive of harm than good, and should be avoided. Paraphrasing the words of one of Shakespeare's famous characters, "To operate or not to operate, that is the question," and a very difficult question it is at times to answer

correctly. If it is decided to operate, when is the proper time? Immediately, or is it better to wait? Again, if, in the course of the operation, the patient begins to show unfavorable signs, at once the question arises, shall the surgeon stop now or complete the operation? Good judgment is required to give a correct solution of this grave problem. Let me, in passing, lay especial emphasis upon the fact that one of the useful lessons that it is well for every would-be surgeon to learn early in his career is embodied in the old adage, "A live dog is better than a dead lion," which, freely translated, would read something like this: "Better an incomplete operation to be finished at a later date on a patient in good condition than a technically perfect operation completed on a moribund patient." In our enthusiasm to fulfill all of our obligations to our patients we sometimes run the risk of overdoing.

Just how important a part in determining the results of an operation the time element may play should be understood by every surgeon. In acute appendicitis, for example, the promptness with which the inflamed appendix is removed may count more in determining the final favorable result than the skill of the operator. If we could only get cancer early enough, what a difference it would make! Not infrequently there may be a choice between two or more operative procedures. The determination of the choice between them is again a matter that requires surgical judgment. As I do and see more and more surgery, I am being all the while more deeply impressed with the fact that good surgery is dependent largely upon three factors, namely: (1) a good surgical training is, of course, fundamental; (2) good surgical judgment; (3) close attention to details in the operative technic from start to finish. The surgeon, if he would really excel in his chosen profession, if he would render the greatest possible service to his patients, will be obliged to cultivate these fundamentally important elements contributory to success. The quality of good judgment is essential in every phase of the surgeon's relation to the welfare of his patient. He cannot properly fulfill his responsibilities without it. The diagnosis, the character and amount of information to be gained from the physical examination, the whole plan and course of treatment and after-care, are determined by the judgment of the attending surgeon.

Attention has just been directed to the prime necessity of care in every detail of the operation, preoperative preparation of the patient, aseptic technic, careful dissection and hemostasis, gentle handling of tissues, wide excision of malignant growths, all matters involving meticulous attention to detail. Every enlightened surgeon knows the vital importance played by these factors in the success of his efforts. No surgeon can neglect his obligation in these respects and get away with it for long. That wonderful adjunct to the surgeon's efforts, the *vis medicatrix naturae,* may come to the patient's aid, and the operator may, for a time, meet with a fair measure of success, often far better than he deserves, but in the end he will lose out, to the great detriment of the patient. Let me remind you that in surgery one should never be satisfied with merely a good result, as measured by recovery from the operation, or even a well healed wound. One important lesson that the Great War taught us was that restoration of function must also be considered. Perfection should always be the surgeon's goal, even if he may not always reach it. I am reminded of the small boy who in his arithmetic class was asked by his teacher, "Johnny, how many are two and two?" "Four," replied Johnny. "How many are nine and nine?" "Eighteen," replied Johnny. "How many are twenty-five and twenty-five?" "Fifty," replied Johnny. "Good," said the teacher. "Good, Hell," exclaimed Johnny. "That's perfect." Needless to say, good judgment, while partly a natural gift (some people are endowed with better judgment than others) may be acquired. It is largely the result of study, close observation, thought and hard work upon the part of its would-be possessor. It is one of the obligations of the surgeon to his patient, to his profession and to himself to strive earnestly and diligently to acquire this *sine qua non* of good surgery.

One hears not infrequently the terms "lucky" and "unlucky" applied to different surgeons. It is said that one can get away with murder almost, while another often seems not to have his luck with him, and consequently has poor results as compared with the first. If one will study carefully the methods of work of these two surgeons, one will be sure to find some explanation other than "luck" for the discrepancy between their results, and it will probably prove to be that in his work the one (it may be unconsciously) constantly observes certain fundamental surgical principles while the other habitually neglects them.

Since the responsibilities devolving upon the surgeon are admittedly great, it necessarily follows that he should be well prepared to meet them. This proposition at once raises several interesting questions which we have not time, nor is this the place, to discuss, further than to make a few general observations, some of which have already been hinted at, with reference to the training of the surgeon. Everyone will agree that the training in surgery in the average medical school is defective and lacks uniformity. Too much emphasis is placed on one point here and too little on another there. In certain schools the science of surgery is glorified to the detriment of the art, in others the reverse is true, notwithstanding it has been abundantly demonstrated that the one is dependent upon the other for the fullest measure of success, while either without the other renders unsatisfactory service to surgeon and patient alike. In order to be a well-rounded surgeon, one needs to be well founded in the underlying sciences, anatomy, physiology, biology, bacteriology, chemistry, physics, and so on. In addition to this fundamental knowledge, the better physician, psychiatrist, oculist, dermatologist, gynecologist, in fact, the better all-round specialist a man is, the better surgeon he will be, since all the specialties are so closely connected that a comprehensive diagnosis must necessarily involve a number of them. Obviously, no one person can know everything, but the individual surgeon bears a heavy responsibility in undertaking the care of any individual, because no one can foresee what it may ultimately involve. He is morally if not legally bound to give his patient at least as good professional service as that given by the average surgeon in his community. But is that enough? Will the conscientious surgeon be content to discharge his responsibilities to his patient only to an average degree? The speaker thinks not. In return for the confidence placed in him by his patient he surely will not be satisfied to return anything but the best. This means unremitting study and labor on his part to keep abreast of the constantly increasing flow of surgical knowledge. But now and then, when things go wrong in spite of the fact that one has done one's best, has met one's obligations and responsibilities as best one could, great satisfaction will be experienced if, in thinking it over, one can honestly say to himself "If I had it to do all over again, I could not do differently." In this connection let me pass on to you a remark made to me early in my professional career by the father of a young lad upon whom I had operated for one of those distressing cases of rapidly spreading peritonitis, following a ruptured appendix, that were so common in the early history of appendicitis. I had removed the appendix and drained, and had followed the most approved method of post-operative treatment for the several days that he lived, but all to no avail, as the septic poison had done its work. In those days, when I was younger at the job and had not many patients to lose, it meant much to me, as it still does, to lose one, and I probably showed it. At any rate, the father of the boy, a very kindly person, and himself feeling his loss most keenly, came to me and, placing his hand affectionately on my shoulder, thanked me warmly and expressed deep appreciation for all that I had done for his boy. Then he added: "I see that you, too, feel deeply the unfortunate outcome; but let me, as an older man, remind you that neither you nor any other surgeon can save all of your patients, no matter what you may do." Many times since then have these comforting words of the grief-stricken father come back to me, and always with the same happy effect, to lessen the feeling of discouragement at one's ill success and to strengthen one's courage to continue with renewed determination the fight against disease and death. There are times when words of encouragement, such as these, mean much, and I repeat them here, in the hope that they may be as helpful to some of you under similar circumstances as they have been to me.

Finally, since it is usually the case that the last thing that the true medical man or surgeon thinks about is himself and his own interests, how can he so alter his way of living as to fulfill to a degree, at least, his obligations to himself and his family without injustice to his patients? Are the two interests divergent or identical?

The responsibilities and obligations resting upon the surgeon are inherent in his profession; he cannot escape them. The well-being of his patients, not infrequently their lives, are at stake. So are the honor of the profession and the personal reputation of the surgeon. Such responsibilities are not to be taken lightly. The conscientious surgeon cannot do otherwise than keep himself fit mentally, morally and physically, in order to be able to meet them, and to

fulfill the obligations that are his. No one but he knows what anxieties of all kinds, what a weight of responsibility, what disturbed nights he endures worrying over his patients. After a difficult operation, when reviewing it step by step in his mind, as the conscientious surgeon must do, who of us has not experienced the haunting dread lest, while absorbed in the operation, under the pressure of the moment, or due to unforeseen exigencies of the case, some break in the aseptic technic may have occurred, or a gauze sponge or pack been left behind; some vessel may not have been securely ligated; some suture line may be doubtful, owing to too great tension or to the possibility of impaired circulation; the mechanics of the operation may not have been entirely satisfactory, or perhaps the chances of a good result would have been better had some other operative method been employed than that which was employed; perhaps faulty judgment had been used, or what not? It is all very well to try to be philosophical, and, having done your best, let it go at that. So long as everything goes all right, well and good; but just let something go wrong! It is then that sleep fails the surgeon, his digestion gets all out of sorts, and his duodenal ulcer flares up again, for every hard-worked surgeon, high strung nervously, has a duodenal ulcer, or thinks he has, which is almost as bad.

Just stop and think for a moment how many of you or your surgical acquaintances are supposed to have a duodenal ulcer? It is a surgical disease in more senses than one. When a surgeon gets in this state of mind or body, it is time to stop and go fishing, or to take a trip abroad, just to get as far away from his troubles as possible, at least to get away from the telephone. It is surprising what speedy and miraculous cures are brought about in a very short time by the rest and relief from responsibility and worry that go with a season spent in the great open spaces. The trouble is that we are too busy, or think we are, to take ourselves nature's remedies that we so strongly urge upon our patients, and so fail to take advantage of the benefit that they afford.

Let us bear in mind the first aphorism of the Father of Medicine, "Life is short," and see to it that we do not shorten it still further by foolish disregard of the laws of health which we of all others should scrupulously observe.

THE SCROTUM*

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Many changes may take place in the scrotum. Some of them are of little consequence, some may be disastrous. Not the least thing to be considered is the mental condition that often accompanies any pathological condition affecting the genitals. It is often found necessary to correct some trifling disorder that otherwise would be ignored, to cure a neurasthenia that is wrecking a business career. A man will bear with equanimity a wen on his head or a wart on his nose, but a small varicosity in the scrotum will keep him awake at night and depress him during the day. I have operated upon many varicoceles to cure a malady that was above the neck.

I am presenting here a list of cases seen in the services of the State University Hospital and St. Anthony Hospital:

Epididymitis	227
Hydrocele	108
Varicocele	38
Orchitis	26
Abscess	4
Gangrene	3
Tuberculosis	5
Gumma	2
Adenocarcinoma	4
Carcinoma	6
Sarcoma	1
Spermatoblastoma	4
Total	428

The most common abnormality found in the scrotum is varicocele. This condition, as a rule, is easily diagnosed. Usually it is of little consequence and needs no treatment other than support. There are fewer operations for varicocele now than there were fifteen or twenty years ago. It is not unusual to have an atrophying testicle following a ligation of the spermatic vein, and only those that present definite discomforts should be interfered with. It is not at the head of this list because only a small per cent are in need of hospitalization.

Because surgeons have learned that most of these cases are better left alone, we find fewer of them in our hospital records than formerly. The operation is so standardized that a discussion of it is unnecessary. One point worth remembering, however, is that the tunica vaginalis should be incised and everted. This will pre-

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vent a hydrocele from developing. I seldom find it necessary to amputate the end of the scrotum, as is advocated by some.

Hydrocele needs little discussion. The pear-shaped mass, which appears first at the bottom of the scrotum and extends upward as the size increases, its irreducibility, its translucency, make the diagnosis easy. The aspirating needle will confirm the diagnosis if there is doubt, and hernia has been definitely ruled out. Occasionally hemorrhage into the hydrocele fluid occurs and makes the diagnosis more obscure. Injection of irritating solutions after aspiration to produce adhesions and closure of the sac are unsatisfactory and have fallen into almost complete disuse. A radical "bottle operation" is simple and effective. With a greatly thickened sac it is well to do a resection of the sac, as a recurrence may take place.

Hydrocele of the cord may extend up into the inguinal canal and is often confused with hernia. Its irreducibility and translucency with an absence of peristaltic sounds make the diagnosis. The treatment is open operation with the destruction of the sac.

Hematocele carries with it pain and discoloration. The principal conditions to rule out in a diagnosis are hernia, urinary extravasation and torsion of the cord. The treatment is evacuation of the blood by open incision.

Hernia presents no difficulty in diagnosis except when it becomes strangulated. The history of a mass which appears first high up in the scrotum and descends; its reducibility; its opacity; the detection of peristaltic sounds through the stethoscope, make the diagnosis. A rapidly arising, fulminating epididymitis has been mistaken for strangulated hernia. The cure of hernia is outside the province of this article.

True orchitis is rare except as a complication of parotitis. Occasionally it is seen accompanying measles and typhoid fever. The treatment consists of support, rest and heat. Suppuration rarely occurs. The theory that an attack of orchitis with mumps renders the victim sterile is, in my experience, untenable.

Abscess and gangrene need no special mention, as these conditions are treated as they would be elsewhere in the body.

It has been my lot to have seen but few cases of tuberculosis of the testicle. The diagnosis is usually not fraught with great difficulty. The epididymis is always attacked first. It is not accompanied by pain; the enlargement is not rapid. Occasionally there is a small accompanying hydrocele. The epididymis feels hard, is nodular, not particularly sensitive to pressure, there is an absence of leucocytosis and only a very moderate rise in temperature. Examination of the seminal vesicles through the rectum almost invariably reveals them to be nodular, distended and sensitive. This is an important diagnostic point in differentiating from malignancy of the testicle. The treatment is castration or epididymectomy. The cord should be divided high. It is safer to remove the seminal vesicles at the same time.

Gumma of the testicle offers at times difficulty in diagnosis. Its comparatively slow growth, the absence of pain, the uniformity of its outline, the firm consistency make the differentiation from malignancy at times impossible. The presence of a positive serological test for syphilis is suggestive, but, of course, not conclusive. Quite often a therapeutic test is necessary. There is perhaps no surgeon who has not, at some time or other, removed a testicle and found later, to his chagrin and embarrassment, that it was syphilitic. Little time should be lost in making a therapeutic test. If there is no response in ten to fourteen days, surgery should be resorted to. I have never felt that the removal of a large gummatous testicle under these circumstances was a great injury to a patient.

Tumors of the testicle are almost invariably malignant. Of fairly rapid growth, they usually present no great difficulty in diagnosis. Because of the enveloping tunica they rarely present a nodular appearance. The mass is smooth, firm and heavy. There is no translucency. The epididymis is not involved and may be outlined. As a rule the epididymis is elongated and flattened out, but careful examination will reveal its presence. The cord is not often involved and can be traced to the external ring. There is no involvement of the seminal vesicles as in tuberculosis. Metastases to the chest should be looked for by the x-ray. This is essential because the extent of the surgical procedure depends on these findings. With no visible evidence of extension, a radical removal is demanded. This involves the careful dissection of the deep lymph nodes lying extraperitoneally in the abdomen. Should the x-ray show great extension of the malignant process, the removal of these nodes is of little avail. In this case a simple castration should be done, care being taken to ligate the cord as high as possible and sever with the cautery before attempting

removal of the testicles. This should be followed by irradiation of the lymph nodes in the lower abdomen.

One of the commonest complications of gonorrhea is epididymitis. The diagnosis presents no difficulty. The history of infection, the suddenness of the onset, the rise in temperature, the extensive pain, the hardening and tumefaction of the epididymis, the redness and heat, complete a picture that is easily read. I know of no sure way to prevent this painful occurrence. Certainly rest in bed, support for the testicle, proper diet, intelligent treatment of the urethral condition, lessen the likelihood of this complication. It so happens that most cases of gonorrhea occur in young men who have not yet reached the place in life where they can, without preliminary warning, drop their work and go to bed. The necessity of holding their positions, or jobs, in order to live makes rest impossible. Because of their youth, their occupations are more strenuous. Also because of the exuberance which goes with youth and high animal spirits, because of their unwillingness to listen to or heed advice, even though they pay for it, they continue with activities aside from their work. They dance, they swim, they play football and baseball; they play golf and tennis. They drink hard liquor. Suddenly comes retribution. Without warning one or both testicles become painful and begin to swell. Because of the proximity of a large oil field, it has been my privilege to have seen many of these cases recently. The young men who work in the oil fields work hard, play hard and play recklessly. Just as flies swarm around a honey pot, so do the ladies of easy virtue gather around our oil field boys. An attack of gonorrhea, and in a few days the hard working, hard playing boy is flat on his back with a swollen testicle. Our problem is to put this young man back in school or to work in the shortest possible time. Rest in bed, support of the testicle and ice bags bring relief, but recovery is slow. In two or three weeks, at best, he may attempt light work, with the danger always of a recurrence. Aspiration of the fluid in the tunica vaginalis brings relief from pain and oftentimes hastens recovery. These palliative measures are good enough if time is of no value to the victim, or if his financial circumstances will permit of an extended holiday. But if he must be returned to industry, more drastic measures must be used. I favor an open operation, done immediately on the appearance of the swelling. For want of a better word apparently, this operation has been called "epididymotomy." The procedure is simple, short and effective. The scrotum is opened down to the tunica vaginalis and the testicle delivered through the wound. The tunica is incised, the fluid evacuated, and the tunica everted as in the operation for hydrocele. The edges of the tunica are stitched behind the epididymis. If there is an excess of tunica, it is excised. Occasionally it is necessary to puncture the tail of the epididymis. The testicle is replaced in its bed and the scrotum closed with a double layer of plain catgut. No drainage is needed. There is no more pain or discomfort. The patient is out of the hospital in five days and in ten days is back at work, wearing a well fitting suspensory. I have yet to see the first case so treated return because of pain and swelling in the offending testicle.

It is true, of course, that his gonorrheal infection has not been cured, but that consideration does not enter into the province of this article.

SUMMARY

(1) Pathological conditions in the scrotum are fairly common.

(2) They are usually easily diagnosed.

(3) Only a small fraction of the cases are of dangerous import.

(4) Acute epididymitis should be operated upon immediately for relief of pain and to facilitate return to industry.

DISCUSSION (*Abstract*)

Dr. J. Ullman Reaves, Mobile, Ala.—Dr. Taylor has brought to us a cross section of his 428 cases of pathological conditions in the scrotum. The most interesting point brought out is that epididymitis accounts for 227 of his cases, and that he favors an open operation in these cases. I am not convinced that his after-results are better than those obtained by non-surgical procedures. Cases developing definite abscess of the epididymis demand surgical drainage, but in my hands such cases have been less than 1 per cent. I do not think that operation, done immediately on the appearance of the swelling, will ever become a general procedure, and as long as foreign protein therapy, intravenous calcium, ice bags or diathermy are available, I do not see any need for it. During the past ten years I have seen only one case in which operation was deemed necessary, and only 12 cases in which it was necessary to put the patient to bed except during his time off work between suns. Those with marked elevation of temperature should be put to bed, but, fortunately, such temperature disturbances are rare and not the rule.

The duration of epididymitis is about the same, no matter what the method of treatment, so the simplest form of treatment should be followed which allows the patient to pursue his daily routine.

Hematocele is either acute, which is most commonly caused by trauma or violent muscular strain, but may occur spontaneously in advanced arteriosclerosis or from chronic inflammation in the walls of long-standing hydroceles; or it may be chronic. I wish to exhibit one of my souvenirs in the shape of a trochar which I used in tapping a hydrocele some twenty-three years ago. As this trochar entered the hydrocele sac it must have punctured one of the blood vessels. No blood was in the fluid which came through the trochar. I dressed the scrotum, using a suspensory to hold the dressing in place. Two hours later the patient came back to my office with a large hematocele about four inches in diameter, the scrotum was black with ecchymosis, and the patient was suffering excruciating pain so that it was necessary to take him to the hospital and do an open operation to evacuate the clots. Needless to say that I have never used a trochar to evacuate the contents of a hydrocele since that long ago date.

Dr. Taylor's percentage of hydrocele is rather high (25 per cent of all his reported cases). It would be interesting to know whether this is due to injury to the tunica vaginalis occasioned by previous intrascrotal surgery. I thoroughly agree with Dr. Taylor as to the relatively small number of varicoceles which need operation, and have held this view for the past fourteen years, as I found that 20 per cent of the cases which I operated upon for varicocele returned later with a hydrocele, which I now attribute to injury to the tunica vaginalis during the previous intrascrotal operation. I have no way to estimate the percentage of those who did not return to my hands who possibly developed hydrocele from the previous intrascrotal procedure.

Dr. Raymond R. Callaway, Birmingham, Ala.—Authors disagree as to the form of treatment for acute epididymitis, but the ultimate results following operation do not seem to be any better than from non-surgical treatment. If the epididymis forms an abscess one has to resort to surgery as in any other part of the body. As long as we have heat and support with rest in bed I do not think it necessary to operate. Usually a well fitting suspensory will allow the patient to continue his duties and the inflammation will subside in about ten days.

The non-operative treatment of varicocele is the treatment of choice. A good percentage of operative cases return with hydrocele as a complication, and some complain of pain that they did not have before the operation.

Hydrocele is usually diagnosed by the pear-shaped mass in the scrotum seen by transillumination. This sometimes has to be differentiated from hernia, and it is usually easily accomplished if the examining finger can approximate above the mass and feel the cord beneath, together with the outline of the external ring.

Malignant tumors, tuberculous gumma and other pathological conditions of the scrotum are usually easily diagnosed.

Dr. James L. Estes, Tampa, Fla.—Dr. Taylor's method of treatment of epididymitis is not generally accepted, but it no doubt will save time and get patients out of bed sooner than the exclusive rest treatment which, to my mind, is very necessary in permanently curing the condition. In epididymitis the relief of congestion and tension of the capsule is most important. Therefore, open operation has its place. I think, when necessary, the application of cautery puncture, either through the opened scrotum directly to the capsule of the epididymis, or indirectly through the skin and distended epididymis, is the method of choice. This is the only operative procedure I have employed for seven years. The tension is relieved and the pain subsides rather quickly. In addition to this, foreign protein injections are invaluable.

I should like to ask Dr. Taylor his method of treating orchitis following mumps. I wish further to mention a pathological condition found in the scrotum which is not infrequent, and one that he did not list. It is torsion of the spermatic cord. We all know that this condition requires early surgical intervention to prevent gangrene of the testicle. I wish to report a condition which came to my observation just two weeks ago, that of a tumor of the middle third of the spermatic cord on the left side in a man fifty-nine years of age. The tumor was hard, rounded, slightly nodular and not connected with the vas or testicle, but attached above and below to the cord. Clinical syphilis and tuberculosis were ruled out. The preoperative diagnosis based on the shape, consistency and anatomical location, was fibroma of the spermatic cord arising from the supporting structure. The pathological diagnosis was fibrosarcoma. This was made on the basis of increased cellularity and the small amount of intercellular substance and occasional large hyperchromatic nuclei. In distinguishing fibroma from sarcoma, Borst relies chiefly on the irregularity in size and shape of the cells as well as overgrowth of nuclei and absence of a definite stroma. When the bulk of cells greatly exceeds the matrix, usually tumors are actively growing and require careful removal to prevent recurrence. There is a very small line of demarcation between some cellular types of fibroma and small spindle cell sarcomas. A fibrosarcoma is the happy medium. Sarcomas are practically all spindle cell tumors and are classified as small spindle cell and large spindle cell sarcoma. Metastasis frequently occurs in lungs and liver in large spindle cell tumors, but rarely in small spindle cell tumors. In fibrosarcoma, the chance of metastasis is not to be considered. Therefore the prognosis is good.

Dr. Milton M. Coplan, Miami, Fla.—A paper from a German clinic a few years ago dealt with the use of the acridinium compound rivanol as a medicament in acute gonorrheal arthritis. It was used by direct injection. It occurred to my associate, Dr. Holmes, that we might be successful in treating some of our cases of acute epididymitis by direct injection of rivanol dextrose solution under the sheath of the epididymis. We have at present some 16 or 18 cases that we have treated in our hospital service patients and we are most gratified with the results. The hospital stay has not averaged more than three days and there have been no immediate ill effects. We do not know what remote effect, such as atrophy or dense scar tissue formation, may come from this procedure. One-tenth of a gram of commercial rivanol dextrose is dissolved in 1.5 ounces of sterile water and to this 1.5 ounces of 2 per cent novocaine are added. The antiseptic solution alone is quite irritating and we have incorporated the novocaine for its anesthetic effect.

Dr. R. E. Van Duzen, Dallas, Tex.—I wish to agree with Dr. Taylor that epididymotomy probably offers the quickest way to return the patient to work. It is heroic treatment, but often desirable from an economic standpoint. His apparent high incidence of epididymitis

is due to the fact that only the complicated cases come under his care.

Dr. Taylor (closing).—I have tried thoroughly foreign protein therapy in epididymitis. In my hands it is not satisfactory. An open operation with free drainage of the sac and complete release of pressure offers the ideal method of treatment. From a therapeutic standpoint, from the standpoint of immediate relief from pain and early return to work, I know of no other treatment which equals it.

ECONOMIC PROBLEMS OF PRIVATE ROENTGENOLOGISTS*

By J. C. DICKINSON, M.D.,
Tampa, Fla.

At rather frequent intervals during the past two or three years there have appeared in journals devoted to radiology articles with titles similar to the following: "The Future of Radiology"; "The Radiologist as a Consultant"; "The Radiologist's Relation to the Hospital"; "Is Radiology a Special Branch of Medicine?".

During this same period I do not recall a single article entitled: "Is Surgery a Separate Branch of Medicine?"; "The Future of Otolaryngology"; "The Relation of the Urologist to the Hospital".

A review of these papers indicates to me that there is a feeling of unrest among radiologists, and that radiology is not on so firm a foundation as it should be, or so sound as many of us older men believed it to be a few years ago.

Despite these facts, the two largest medical organizations in America have granted section organization to this branch of medicine, and national organizations of radiologists are functioning in every country where modern medicine is practiced.

It is desired to find the reason for these discussions and hoped that some constructive thought on the subject may be developed. I feel that the only way to correct unsatisfactory conditions is by frank discussion and constructive criticism. I feel that radiologists are not without blame for existing conditions, and that many of the conditions about which we now complain are directly the responsibility of the radiologist.

Radiology has developed with such amazing rapidity during its short existence, it is inevitable that many mistakes have occurred and pernicious practices have become established, the evil of which was not apparent at the onset.

The relationship of the radiologist to the hospital is a favorite subject. Many of us have seen radiology in hospitals develop from a single piece of equipment situated in the most out-of-the-way corner with an occasional exposure, to the point of large, elaborately equipped departments occupying much floor space to which a large percentage of the institution's patients sooner or later are referred.

In the beginning, the occasional patient was seen either by some physician who owned an x-ray machine, or by a nurse who knew enough to close a switch and count seconds. As the field developed, an arrangement was frequently made between the hospital authorities and some interested physician on some kind of percentage or fee-splitting basis. The hospital collected the fees and remitted a part to the man in charge.

Through this practice two evils developed. First, radiologists were placed in a preferred list insofar as the other members of the staff were concerned. Many times a fee was collected by the hospital, especially in emergency cases, while the attending surgeon, not being assisted by the hospital, collected nothing.

Second, this practice laid fair ground work for antagonism insofar as the other members of the staff were concerned. They at once became interested in the fees charged for x-ray examinations and, I think, rightly so, as the position was assumed that the charge in the x-ray department was a hospital charge and not a professional fee, and that, as a hospital charge, it must be paid before the patient could leave the hospital. Since it was a hospital charge, then all charges had to be uniform without due regard for the patient's financial status, which led to the schedule of fees.

There is no more reason for a schedule of fees for x-ray examinations than for surgical operations, and would the surgeon tolerate the latter? I believe that there has been entirely too little elasticity in the charges made for x-ray examinations. We charge a great many people too much and a few entirely too little.

Another evil that developed was that the hospital authorities soon began to look with envy upon the fees paid the radiologist, and they desired to have the entire income for the department. So why not hire a cheaper man by the month and keep the difference? The thought that a hospital has no right to expect a part of the professional fee of a radiologist did

*Chairman's Address, Section on Radiology, Southern Medical Association, Twenty-Sixth Annual Meeting, Birmingham, Alabama, November 15-18, 1932.

not seem worthy of consideration. The fees in the x-ray department are certainly as much the radiologist's as are the fees collected by the surgeon in the department of surgery. The difference came about from the fact that a custom was established and developed whereby the hospital collects one and not the other.

There also developed another practice, equally pernicious. It soon became recognized that radiology required training and experience and that the men devoting real thought to it had acquired a much greater proficiency than the average. In earlier years these men were few as compared to the number of hospitals. Consequently one man would divide his day between a number of hospitals, also maintaining a private office where most of his time was spent. He would visit one hospital after another, attempting to make diagnoses by dictating reports based on certain shadows. Only very rarely was a patient seen personally. No time was given for clinical conferences or for actually examining a patient or taking a history.

No branch of clinical medicine can be satisfactorily practiced in which the contact between physician and patient is a third person. Radiology is clinical medicine, and if it is to stand as a special branch of medicine, radiologists must be clinicians and must be able to discuss histories, symptoms and pathology with other consultants in a given case. A radiologist's opinion is of value only in proportion to his ability to interpret shadows into terms of pathological entities. I believe that one of the reasons that men in other branches of medicine often undertake to do x-ray work in their field is that too many radiologists insist upon describing pictures and not pathology.

If you discuss with men engaged in other lines of practice their reason for installing x-ray equipment, they will, in most instances, admit that they are not interested in roentgenology, that they do not consider themselves competent roentgenologists. Many times they explain that they were going to undertake only the simpler cases, particularly in patients who cannot afford to pay a roentgenologist's fee for consultation. They expect to continue to refer the major portion of their patients to the roentgenologist for examination. It has not been my experience that the plan is followed; for once the work is undertaken they attempt any and all cases, at times actually soliciting work from other physicians in lines other than their own. They even, at times, offer not only the inducement of reduced fees, but the added inducement of referring patients in return for x-ray work. Since patients seen by roentgenologists are all referred, they must be returned to the referring physician. The roentgenologist has nothing but his services to sell and is greatly handicapped as a trader.

The man engaged in some other branch of medicine is not interested in roentgenology, and if he were he has not the time to keep informed as to radiological progress in his own field, much less in the general field of radiology.

Entirely too much is delegated to technicians. Entirely too many patients are referred to radiologists for consultation who never see the physician and whose only contact is through the office attendant and technician. It is a small wonder that such a patient has little respect for the importance of the x-ray examination. In the mind of the patient all it amounts to is that some pictures are taken for her physician to see so that he can tell exactly what her trouble is.

There has been entirely too much mystery about radiology and, as for that, about medicine in general. Many times patients are seen who remark, "I have been x-rayed before, but nobody would tell me anything." In our office, patients are seen personally and histories are taken before the examination is completed. When this has been done patients are told to return to their referring physician, to whom a written report will be made. If we are questioned as to our findings, we explain to the patient that we are seeing him as a consultant, that our work is only a part of the examination, that we wish to discuss his case with his physician, and that the physician will tell him the result of our examination.

If the question of the films comes up, we explain that the films are kept on file in our office and will be available to him or any physician should he so desire. We explain that after he has seen his physician, if he wishes to talk to us, we will discuss the examination with the patient and will give him a copy of our report if he desires it, or furnish a copy of our report to any physician whom he may wish to consult in the future.

After all, who, if not the radiologist, should discuss his examination with the patient? We insist that the roentgenograms do not belong to the patient, that what he has paid for is an opinion, and he certainly is entitled to have that directly and in writing if he desires.

As to the conduct of radiology in hospitals, I

believe that every radiologist recognizes that the greatest handicap to the private practice of radiology is the competition of hospital departments operated by salaried employes. The hospital is engaging in the practice of medicine in competition with private individuals. How long are the hospitals going to confine this to the field of radiology? Is it not logical to suppose that it will gradually be extended to other departments if it can be shown that they can be operated at a profit? It already has included the department of clinical pathology and emergency service. Is this practice not a very definite step toward state or community medicine?

I believe that the x-ray work in a recognized hospital should be done on exactly the same basis that work in other departments is done: that the institution should charge patients a fee for the x-ray department just as is done in the case of the operating room. The radiologist should make and collect his own fee for consultation. In this way the hospital will have an income to cover the investment in space, equipment and operating overhead. The professional fee will be entirely independent and fee-splitting will be tabooed in radiology as in all other branches of medicine. The objection may be raised that every physician will do his own interpreting and that the radiologist will not be called. I do not believe this is probable. Hospitals have been able to regulate the surgical department, and if radiologists will cooperate by setting up worth-while standards for those who call themselves consultants, then hospitals will have ample reason to say who is competent to use the x-ray department.

That every roentgenologist in private practice has been made to feel acutely one or more of the above conditions is, I believe, certain. The field has been greatly narrowed. High voltage therapy alone does not seem to appeal to the men in other branches of medicine. In therapy, the responsibility seems sufficiently great and the returns sufficiently poor that it does not appeal to the occasional dabbler.

If some solution is not found for these problems, I predict that in ten years the roentgenologist, as a private practitioner, will have disappeared and we shall find ourselves in the position of hired men. It would be a sad day for medicine should such a condition come about. Practically every worth-while development in roentgenology in my knowledge has come as the result of the labor of men who have devoted their entire attention to roentgenology. If the field is made so narrow that it is not attractive to men of ability, it will mean that progress will surely be handicapped.

CONCLUSIONS

Such pessimism would be out of place unless some remedy could be suggested, and I submit the following as worthy of consideration:

(1) Better understanding and cooperation is needed between roentgenologists and men in other branches of medicine.

(2) There should be greater elasticity of fees for x-ray work.

(3) An effort should be made to place roentgenology in hospitals on the same basis as work done in other departments, namely: a fee should be charged for the use of the hospital equipment, and the roentgenologist should be permitted to make and collect his own fee.

(4) I would also make a plea for closer contact between roentgenologists and their patients. Be sure that a patient referred for examination knows that he has consulted a physician who is not merely a photographer, but a clinician whose opinion is sought for the purpose of making a diagnosis.

THE TREATMENT OF VINCENT'S TONSILLITIS WITH COPPER SULPHATE AND SODIUM PERBORATE*

By L. Chester McHenry, M.D.,
Oklahoma City, Okla.

It has become a custom in our office to consider a diagnosis of Vincent's infection of the tonsil confirmed when the lesions respond within twenty-four hours to treatment with copper sulphate and sodium perborate. When they do not respond we resort to smears, cultures and darkfield examinations. Of course, if from the history and clinical examination, we are suspicious of diphtheria or syphilis or an acute pyogenic or streptococcic infection, the microscope and the culture tube are used immediately.

This is probably an unscientific procedure in this laboratory age. To justify it we have collected our last forty cases of Vincent's tonsillitis and studied them in regard to history, clinical appearance and response to treatment.

History.—All cases complained of sore throat. The severity of symptoms varied from those of

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a man who said that one of his tonsils had been sore for several months, but who had not been inconvenienced therefrom, to a lady who was seen ill in bed at home. She had been ill for four or five days with a severe sore throat. Her temperature was 103°, her tonsils were very markedly swollen with deep ulcerations in each and she was unable to swallow. Fever was recorded in only three other of these cases and they were all below 101°. The average duration of acute symptoms was six and four-tenths days.

Clinical Appearance.—There was definite ulceration in 35 cases. In 10 of these the ulcers were cryptic only. The other 25 had irregular areas of tissue destruction, some of them so large as to destroy half of the tonsil. The ulcerated surfaces were all covered in whole or in part by a rather thick membrane which varied from a dirty white or gray to a brown or greenish hue. The membrane was not usually easy to remove and there was slight bleeding when it was removed.

The five cases without gross ulceration had thin pale gray membranes covering a congested and slightly swollen mucosa. Diagnosis was made initially by smear and darkfield.

Swelling was quite inconsistent. There was no remarkable local swelling in 14 cases, slight swelling in 9, moderate swelling in 7, and marked swelling in 10 cases.

The anterior cervical lymph nodes were palpably enlarged in 33 cases, but there was palpable tenderness in only 18.

Results of Treatment.—The average amount of time required for the relief of symptoms was two days. Eleven cases were relieved of symptoms in one day. One case required four days before he obtained local relief. Three cases were not included in these averages because they reported for treatment at only 4 to 7 day intervals instead of daily.

The average amount of time required for the disappearance of local swelling was 2.4 days.

Complete disappearance of membrane was achieved in the average time of 4.6 days.

Four cases required only 2 treatments each, 4 had 7 treatments each, and 1 case had 10 treatments. The last mentioned had multiple cryptic ulcerations where it was difficult to apply medication to the depths of the lesions. The average number of local treatments was 4.5.

There are 9 recorded recurrences in 6 patients. We do not believe that these are all the recurrences which have happened in this group of cases. Some persons are prone to consult a different doctor when some trouble for which they have been treated apparently comes back. This condition is liable to recurrences because there is usually infection of the gums which lies in wait to reinfect the tonsil, and it is practically impossible to kill all the organisms in a cryptic tonsil by any form of local treatment which does not also eradicate the tonsil.

One patient is of much interest because of recurrences.

This was a white woman 70 years of age complaining of left-sided sore throat of two months' duration. The left tonsil was red and swollen and presented a deep ragged ulcer covered with white membrane and buried beneath the anterior pillar. This cleared up readily under treatment. One month later there was a mild recurrence which cleared up on one treatment. Then there were successive recurrences at nine months, fourteen months and eighteen months after the initial infection. These were all cleared up by from 3 to 6 treatments. In the past seventeen months there have been no recurrences. This patient was urged to have this tonsil removed both because of the recurrences and because 5 recurrent ulcerative infections in the same site in a patient of this age cause one to consider the possibility of development of malignancy. Because of her age the patient refused to have the tonsil removed.

TECHNIC OF TREATMENT

(1) Removal of necrotic debris and membrane which separates easily by a mild alkaline spray and gentle wiping with a cotton-tipped applicator.

(2) Application of 10 per cent aqueous solution of copper sulphate to all ulcerated surfaces. This should be thorough and it is our endeavor to reach the depths of all pockets and infected crypts. Sometimes a spray is used, but more often fine cotton-tipped wire applicators. This procedure is repeated every day until signs of acute inflammation have disappeared and every second day until the membrane has all disappeared. By the time the membrane is all gone the areas are clean and apparently covered with healthy epithelium.

(3) The patient is given a prescription for sodium perborate and instructed to use one-half teaspoonful of this in one-half glass of warm water as a gargle and mouth wash every two hours. Very few of them will use it so often, especially after their pain has been relieved.

When there is evidence of infection of the gums, the solution of copper sulphate is also applied to the gum margins and the patient is instructed to use the perborate as a dentifrice as soon as his gums will stand the use of a soft toothbrush. As soon as the tonsillar lesions are

cleared up these patients are referred to their dentist for further treatment of the gums.

Tonsillectomy is recommended in all cases. We do not feel that any local treatment can completely eradicate Vincent's or other organisms from the depths of cryptic tonsils and the remaining organisms are an ever-present danger to other parts of the body.

We do not use intravenous arsphenamine or similar preparations because we have not found them necessary in these tonsillar infections. In cases which do not respond to local treatment and in Vincent's infection in parts of the body which cannot be reached by local treatment we feel that it should be used. One patient in our series had one intravenous injection. This was because he was unable to report for treatment except at weekly intervals and was already suffering from a recurrent infection.

Vincent's infection may be and often is superimposed upon any of the ulcerative lesions of mucous membranes. We have seen two cases of ulcerated malignancies of the tonsil with complicating Vincent's infection. The usual treatment will usually clear up the Vincent's and of course the underlying condition must be treated as soon as it may be recognized.

This report is presented merely to give a comparative basis for evaluating the method of treatment. The method is not original with us. My father has been using it for nearly ten years. We should be glad to give the originator due credit, but do not know him.

DISCUSSION (*Abstract*)

Dr. L. B. Nicholson, Gadsden, Ala.—From a practical point of view I feel that this method is all that can be desired. The results, relief from complaint in an average of two days, disappearance of membrane in 4.6 days, disappearance of swelling in half of this time, leave nothing to be desired.

The method of handling suspicious cases, the cultures for diphtheria, darkfield and a'so serologic examinations for syphilis, offer proper safeguards against error.

It is highly important to rule out syphilis either as a local or systemic condition before neoarsphenamine is given, since one or two doses of neoarsphenamine may retard other manifestations of syphilis for a dangerous time.

The basis for any successful treatment of Vincent's angina depends upon bringing the organisms within reach of air and medicinal agents. Thorough cleansing and the use of sodium perborate accomplish this.

Sunlight and ultraviolet light may we'l be considered as adjuncts to the chemical agents ordinarily used.

I thoroughly agree with Dr. McHenry that the tonsils should be removed in all of these cases.

Dr. Lee Cohen, Baltimore, Md.—Scrupulous cleanliness of the mouth, keeping it free of food particles by the copious use of normal salt solution as a mouth wash, gargling after each meal and the use of the tooth brush whether the gums bleed or not, is essential in the care of Vincent's angina. My patients are provided with ten of the small (takamine) Japanese bamboo tooth brushes, to be used on arising, after meals and before retiring. The five used today are boiled for three minutes before being used again in forty-eight hours; the other five are used tomorrow, and so on. For a number of years it has been my good fortune to obtain very good results by the direct application of pure carbolic acid to the infected surfaces. I use large applicators for the tonsil region and especially constructed, fine, flexible applicators around and between the teeth. Immediately following the application of the phenol about the teeth of the entire lower jaw, the region is freely sprayed with 75 per cent alcohol. Then the same procedure is employed about the teeth of the upper jaw and any other surface involved. This treatment is repeated in forty-eight hours. Between the treatments, in addition to the saline mouth wash and tooth brushes above mentioned, the patient is directed to use a mouth wash of 50 per cent alcohol three times daily following the saline solution. It is rare indeed that the most extensive involvement with Vincent's angina cannot be cured in from three to four weeks by these measures.

Dr. Wm. A. Wagner, New Orleans, La.—Some cases of Vincent's angina will get well with little or no treatment, whereas others will die in spite of all treatment. Today very few cases of severe Vincent's infection are encountered because of early recognition and institution of treatment. Nevertheless, one should bear in mind the possibility that a given infection may become serious. One should contemplate constitutional therapy in cases which do not respond rapidly to treatment and especially in those cases in which involvement occurs in the larynx or an area difficult to reach by local therapy.

Several years ago I saw a case which began as an apparently mi'd gingivitis and culminated in an autopsy in which the lesion involved the entire respiratory tract and esophagus. The lesions were not only seen in the pharynx, nasopharynx, larynx and trachea, but also in the parenchyma of the lung. Death was attributed to a pneumonia in which the organisms of Vincent were recovered from the lung tissue. Therefore, do not procrastinate with mild local treatment if improvement of the lesion is not noted early, but institute more drastic methods, especially constitutional treatment, such as the intravenous use of neoarsphenamine.

Dr. Geo. H. B. Terry, Oteen, N. C.—Vincent's angina, when limited to the tonsils, can usually be cured promptly by local applications, although I have never employed the treatment described by the essayist. It is surprising to me that no one in this discussion has mentioned the use of nitrate of silver. In fourteen years in a large hospital service, I have never found it necessary to replace it with anything e'se. The secret is in using it only once in forty-eight hours, but in 50 to 90 per cent strength in the severe cases. In two days the patients will all be much relieved. The strength of the solution is then decreased.

Dr. O. G. Kendrick, Tallahassee, Fla.—I use a 25 per cent solution of silver nitrate in cases of Vincent's angina where there is much tissue destruction and my results have been very pleasing in most instances. In cases with practically no tissue destruction, I find that mechanical cleansing and the use of sodium perborate as a mouth wash and gargle usually give good results within a few days.

I am connected with the Infirmary of the Florida State College for Women and during the past two school years we have had two epidemics of Vincent's infection, both of which I traced to carriers in the kitchen. At the beginning of this school year I made cultures from the mouth of each employe in the kitchen, and as carriers were found they were given a solution of sodium perborate to use as a mouth wash and gargle, under the strict supervision of the dietitian in charge. So far this year we have had no trouble with Vincent's.

I have seen a few patients with quite a severe infection and much tissue destruction, and they have responded nicely to neoarsphenamine intravenously.

Dr. M. M. Cullom, Nashville, Tenn.—The cases I have seen have been mostly of the moderate type, though I have seen cases that were rapidly destructive. I have seen patients who in the morning had a patch on the tonsil and by night a cavity that one could place one's thumb in.

It is evident from the great number of remedies suggested in the discussion that no remedy is altogether satisfactory. It is probable that milder types can be relieved by any one of a number of antiseptics and it is likewise probable that some of the virulent cases cannot be saved by any known form of treatment.

Twenty-five years ago I concocted a formula for use as a spray in cases of tuberculous laryngitis. It proved of great value in a number of cases. It is good for superficial infections of any kind. I have used it with success in my cases of Vincent's. The two antiseptic ingredients are carbolic acid and formalin. The formula is as follows:

Phenolis Formalin	aa oz. ss
Sodii biboratis Sodii bicarb.	aa oz. i
Glycerini	oz. iv
Aquae destil. q. s.	oz. xvi

This is an effervescent solution and should be left uncorked for twenty-four hours. Dilute with three parts of water to use as throat spray.

The combination of carbolic acid and formalin seems to create an antiseptic of great power, useful in a variety of cases.

This can be applied to the throat on a cotton-tipped applicator in full strength. As a throat spray or gargle it is diluted with 3 or 4 parts water.

Dr. McHenry (closing).—The cases which I have reported have been seen in private practice. The other methods of treatment discussed may be better in some types of the disease. However, for the type of cases which we have seen the copper sulphate and sodium perborate treatment has been very satisfactory.

THE DEVELOPMENT OF A STAFF*

By W. F. DRAPER, M.D.,
Richmond, Va.

While the chief executive of a health department, whether state, municipal or local, must always remain the responsible head, he should endeavor to develop his organization in such a manner that it may function smoothly and efficiently when the term of his service has come to an end. In the general scheme of things, anyone of us may be likened to a relay runner who takes up the race at the point where his predecessor left off for the purpose of making his utmost contribution and turning it over to another to be continued.

In the fulfillment of this aim the development of a capable, enduring and responsible staff is a most essential consideration. Not only must its members be chosen with due regard to their general aptitude and professional qualifications, but they must be given every opportunity and encouragement to enable them to attain their maximum degree of efficiency and responsibility. Broad and continuing contacts with the ablest members of the profession, fellowships for courses of advanced study, projects of individual research, the preparation and delivery of papers on scientific and professional subjects, and the representation of the department in various connections, are an indication of the means toward gaining this end.

It should be a fundamental principal that the members of a staff should belong entirely to the organization which they serve. Financial support from outside agencies is temporary and uncertain at the best and should not be utilized in such a way as to threaten the destruction of the pillars of the organization should it be unexpectedly withdrawn.

I am convinced that the standing and reputation of a chief executive among those with whom he has to deal are determined very largely by the character and quality of the members of his staff. Not only do they insure the highest degree of success to the organization for which he is responsible, but they enhance his reputation and magnify his importance in the general esteem. Whether he wills it or not, he receives full credit for the selection and performance of his personnel, all of which he well deserves.

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It is scarcely conceivable that the importance of developing a staff of maximum efficiency should go unrecognized by any administrator of long experience, but it is a fact that it is all too frequently ignored because of the immediate advantages to be gained by administrative short cuts and the time and patience that are required to develop it to its fullest degree of usefulness.

In my own experience, I have long been conscious of two distinct types of administrator. One is the type of man who is unwilling to delegate authority to his assistants and who insists upon knowing every detail of the work throughout his organization. He receives reports of every action and gives specific instructions as to how each issue shall be met. There are few indeed who possess such a capacity for infinite detail as to enable them to do all of the thinking for a complex organization. Too often this type of administrator finds himself overburdened with work, surrounded by a group of dependent assistants, and unable to extricate himself from a mass of detail long enough to devote proper attention to the formulation of constructive policies and the consideration of major problems which should constitute his main responsibility. In short, he endeavors to do the thinking which his assistants are employed to do and actually serves as the executive officer for the divisions within his organization.

This type of administrator begins his work with great confidence and seeming ease, and for some time he may be unconscious of the increasing strain which is being placed upon him. Without trouble he directs his own activities and without much difficulty he may add the direction of one or two or three others. Then these major subordinates increase twofold or more and each has under him various subordinates, all of whom look to the chief for guidance. This is a fair picture of the administrator who centers responsibility upon himself.

The other type of administrator defines clearly the duties of his chief assistants and places upon them the responsibility of able and faithful performance. He requires satisfactory results, but does not concern himself with the minutiae of their achievement. In matters of principle and policy he expects to be consulted, and he is ready at all times to assist in the solution of problems of special difficulty. He insists, however, that the matters which are placed before him by his assistants shall have first received their best thought and consideration and that their judgment as to the course of action to be taken shall be expressed. He may then add his thinking to theirs in an effort to arrive at the best solution.

This type of administrator confronts his main troubles at the outset. But as time goes on and his assistants gain in experience and develop the ability to assume greater responsibility the burden of administration is progressively lightened.

There is something in human nature that responds to the reposing of confidence and the placing of responsibility. Self-respect is increased, a determination to measure up to the job is aroused, and the knowledge that to the individual will be accredited the success of the undertaking in the eyes of his chief and of his associates will inspire him to greater efforts than would otherwise be possible. Under these conditions there is a development in the capacity of the personnel to accept and discharge duties and responsibilities, and a marked increase in efficiency and morale. The organization is no longer dependent upon one individual for the routine performance of its functions, but operates smoothly and effectively and its members inspire confidence on the part of those with whom they come in contact.

There is another factor in which the human element may play an important role, which is that relating to the development of policies for the guidance of the organization. The administrator may, if he chooses, use the short cut method of establishing and announcing the policies of the organization without recourse to the members of his staff. Such policies will doubtless be accepted and carried out. If, however, their soundness is challenged by those outside, the only answer that assistants are in a position to give is that they are the policies of the organization and therefore must be carried out.

It has been my observation that persons who are capable of directing the component parts of an organization are also capable of contributing many valuable thoughts pertaining to the functioning of the organization as a whole. Sounder policies will usually be developed in the long run if they are considered with the staff rather than by the administrator alone. Here again it is human nature to be better satisfied with policies when the underlying reasons for them are thoroughly understood, and when the ones who are to carry them out have had a voice in their making. I am assured that it is a wise procedure therefore to develop policies in collaboration with the members of the staff. When this is done there is a sense of responsibility for the success of the organization which is otherwise

lacking as well as the ability to explain and defend the policies under any conditions that may make this desirable.

An organization developed in accordance with these principles is in effect conducted by a group of partners each of whom contributes to its operation and receives material benefits from its success. Contrasted with an organization comprised of a chief executive and employes who are merely hired to do their work there can be little doubt as to relative achievement and continuing ability to fulfill in the highest degree the purposes for which they were created.

THE SIGNIFICANCE OF EXTRINSIC INFLUENCES UPON THE BEHAVIOR OF THE GASTRO-INTESTINAL TRACT*

By L. W. Roe, M.D.,
Mobile, Ala.

In no other realm of diagnostic medicine, I would venture to assert, are there to be found problems which embody so much of fascinating charm, perplexing or exasperating trials, gratifying reward, and in many instances professional defeat, as are found in endless parade before the clinician of those with disorders of the gastro-intestinal tract. Because of the urge to render greatest service, and because of the charm and interest of exploration, the physiologist and clinician of the past few decades have added much material to the already valuable store of fundamental knowledge which has been handed down by workers of other generations.

There is fascination in the clinical work because of the varied complexities presenting. The unfolding of the story, the sagacious weighing of facts, and at times even uncanny cleverness of interpretation, afford the means, through judicious counsel and guidance, completely to relieve, or at least alleviate the disorder which has impaired the patient's physical fitness and rendered him incapable of fulfilling his business or social obligations; incidentally, the consummation of a perfected task is the reward for effort.

But the way is not always smooth. There is a goodly group of perplexing and exasperating problems, the dealing with which almost drives the clinician to despair, and even shakes his faith in his professional skill. To this type, after many conferences, laborious effort and the enlisting of the various clinical and laboratory aids, he is even then not always able to give relief. This group I wish to discuss at length later.

Perhaps it is safe to say that 90 per cent of those with disorders of the gastro-intestinal tract have no intrinsic trouble at all. Nevertheless, they are patients sick and present a clinical picture with disturbances as varied as the true maladies themselves of the gastro-intestinal tract. However, if we should base our working assumption on such a predicate, it is obvious that we shall be led afield into a maze of more serious difficulties. I feel confident, though, that the greater proportionate diagnostic errors are committed by the clinician when he permits his reasoning to become too fixedly centered upon the pathological. This particular drift of the mind along so narrow a channel, with which you are quite familiar, is a delinquency in which any of us may find ourselves. Such a trend, I might say, is a professional weakness. In part, our diagnostic success depends on how well we guard against this pitfall. The penalty paid by the sick, the embarrassment to the physician because of a failure which necessitates retracing his steps, admitting his error, again surveying the facts, revising and redirecting a program, are frequent occurrences.

At the risk of provoking a challenge, I would make bold to assert that the clinician today, equipped as he is by his years of studious observation, and the application of the knowledge handed down by workers of the past, and of his co-workers of today, should without material difficulty properly analyze and correctly diagnose the commoner pathological disorders, or the usual physiologic disturbances of the gastro-intestinal tract.

Dismissing this subject of the intrinsic in a casual fashion, and turning our attention to the extrinsic agencies for explanation of gastro-intestinal misbehavior, our task is more difficult. Herein are to be found the greatest professional successes, and on the other hand the most dismal diagnostic failures. There is no ailment, either acute or chronic, which may beset mankind that does not either directly or indirectly overthrow the normal processes and behavior of the gastro-intestinal tract to a greater or less degree. For instance, the insidious influence of early tuberculosis upon the digestive processes makes it quite possible to care for the ailing stomach over

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*Read in Section on Gastroenterology, Southern Medical Association, Twenty-Sixth Annual Meeting, Birmingham, Alabama, November 15-18, 1932.

a period of months before this extrinsic influence is recognized. Again, an unrecognized oncoming pneumonia can reflect its effect upon the abdominal viscera in such a manner that operation for removal of the appendix is performed, to the later remorse of the clinician, and, to say the least, near tragedy of the patient. Metabolic deficiency disorders, such as clinically submerged pellagra, often may becloud one's perception of the real reason for gastric or intestinal overthrow. Syphilis, with all its vague and varied behaviors, does not leave the gastro-intestinal tract undisturbed. The allergic manifestations upon the stomach or bowel, we are told, can distort both the functional behavior and the anatomical appearance to such an extent as to mislead both the clinician and the radiologist. Thus we may follow on and on through the category of man's many ailments in an endless repetition as above recited.

The most subtle and vicious extrinsic disorganizing agency of the gastro-intestinal tract is found among the fundamental psychopathic inferiors, using this term in its broadest sense, which carries with it gradations *ad infinitum*. A great percentage of gastro-intestinal disorders originates from this group. It is a reasonable sequence when the normal poise in such patients is disturbed. It is not fitting that they be dismissed as whimsical, not meriting the usual painstaking professional consideration. Their illness is definite, just as much so as a patient with a true peptic ulcer, and it may display clinically all the usual signs, and likewise simulate any true disease of the gastro-intestinal tract. This fundamental deficiency is a misfortune, and the appeal for relief should find a professional response most sympathetic and patient when this extrinsic influence is manifest. Here it is necessary for the gastro-enterologist to leave his orthodox field to become a counseling psychiatrist. Usually, if he is a good listener, he will acquire the important cue of an otherwise perplexing problem. How well he serves is dependent on the astuteness of his perception of this extrinsic force and its background. Then, in his dual position as gastro-enterologist and psychiatrist, by judicious planning and adroit counsel in which many of the basic truths are given to his charge, he may bring about, through cooperation, relief which is often permanent.

It occurs to me, from my own professional relations with particular groups, that there exist other elements which should be reckoned with, either as specific entities or jointly associated with the psycopath, as well. These are factors of social maladjustment, misfits in life's pursuits, and social or business problems over which the individual has no control. It may appear that this is going far afield in explanation of the overthrow of the normal processes of the digestive tract, but when due consideration is given to the influence of these extrinsic agencies on the emotions, and the force of the latter to disturb the normal control of the sensitive vegetative nervous mechanism of the gastro-intestinal tract, which usually is first disarranged, then we can better appreciate and understand these varied misbehaviors and the influence of the extrinsic element. The element of physical or mental fatigue also belongs in the category of the extrinsic. While either of these affect generally the whole physiologic mechanism of the body, at the same time the digestive apparatus suffers in kind, as it, too, is weary and tired, its nerve controlling force as well. These extrinsic influences are more easily recognizable.

The following abbreviated case histories are examples of the extrinsic influence:

Case 1.—Miss H., age 19, with no occupation, just out of high school, gave an unimportant previous history and family history, except for the statement that all members of the family were "nervous."

She used no coffee, tea or tobacco. She did no work at home, did not like to work, and her aunt stated that she became angry if urged to assist in domestic tasks. The aunt's appeal was to "do something for Bessie." "All were alarmed because Bessie had been vomiting for the past two months everything she ate."

Gastro-Intestinal History.—She had been a poor eater for several months; she was at this time on cereals and milk, most of which she vomited about one-half hour after meals. She was afraid to eat. She had epigastric pain when her stomach was empty; epigastric swelling shortly after food intake, with belching of gas and food, and later vomiting, some "heartburn" and palpitation. She was constipated. There was a history of similar attacks in the previous four years. A complete clinical, physical and laboratory survey, including gastric analysis, was made with negative findings.

It was concluded that her mannerism, responses and nutritional state were not in keeping with gastric disease. Neither should we expect such disease at her age. Her statements showed that she was out of tune with her station in life and was rebellious of it, aspiring to a social level which she could not attain. Fortified by the results of the survey, which expressed to her our professional and personal interest, the advice was given, by election, to her alone. She was told of her untenable position, counseled as to the wisdom of a purposeful life, which carried with it her obligation to her people and others, an ordered day, her obligation to work; the need for social contacts in outdoor life, the need for communion in social and church life, and the method she should pursue in acquiring them. She was warned that her present position meant finally an utterly useless career. Her response to this new light

was pleasing and immediate. She accepted the counsel in full and, with the aid of a quieting digestive portion, her digestive disorder cleared up. She now, a year later, is well poised and has had no return of the digestive disorder. This patient, I should say, was a social misfit.

Case 2.—Mrs. E., age 53, was a definite psychopath, with repeated attacks of catarrhal colitis. She had extreme fear of cancer. After a full examination with negative findings she was dealt with in a general way much like *Case 1*, but in this instance, because of the psychopathic element, she was given a definite disease which her medical program relieved. Her specific colonic disorder has not returned, but she has made professional visits for other digestive upsets. She probably will always need her physician as a cheer leader.

Case 3.—Mr. A., age 35, occupies an important insurance position. He complains of a definite and exaggerated stomach disorder and pain about the gallbladder, which followed a strenuous business affair of several days' duration. His poor business strategy caused a loss, for which he inwardly chastised himself. He was definitely emotionally depressed. The record as taken showed no evidence of gastro-intestinal disease nor anything notable in his past or family history. Under suitable guidance and counsel the gastro-intestinal condition has improved, but as a misfit in business and a psycopath he tries to excuse his failure, the gastro-intestinal disorder being a good thing to put responsibility on. The ultimate relief in this case is questionable.

Case 4.—Mrs. M., age 34, had no children. The past and family history were of no moment. She complained of gastric or intestinal misbehavior at intervals for 3 years. Repeated and exhaustive studies over this period of 3 years, following her first conference, gave no evidence of disease. Her habits were those of a purposeless, idle housewife, somewhat discontented with her social position. No counsel gave aid for long. She sought relief in clinics of other cities, with temporary aid. Not until financial reverses compelled the doing of menial domestic work did she definitely get continuous relief. This case is of the type of the higher fundamental psycopath.

These cases are illustrative of those found in every social level. No walk of life is exempt. The domestic, the social leader, the laborer, or the merchant each has representatives in the conference room. Each case requires its own yardstick to measure its true dimensions, and proper consideration must be given to the fundamental stock, environment and the relative susceptibility to emotional overthrow under strain. To obtain the best end, it is necessary for the physician to meet his patient on common ground, in a spirit of mutual accord for a common purpose. Otherwise he vitiates much of his helpfulness.

DISCUSSION (*Abstract*)

Dr. J. E. Knighton, Shreveport, La.—The doctor's reference to misleading statements by patients serves to emphasize the well known fact that history taking is an art, and to master that art one must combine a working knowledge of psychology with a study of human nature.

The pathologic conditions outside the digestive tract which produce gastric symptoms are so well known that it is not necessary to consider them all at this time. Common examples of such conditions are gastric crises resulting from tabes, exophthalmic goiter or migraine.

I shall briefly report a case of severe gastric hemorrhage which recurred from time to time over a period of about four years. Between these attacks careful studies of the gastro-intestinal tract by x-ray and otherwise were made and no evidence of peptic ulcer could be demonstrated.

Moderate enlargement of the spleen was observed and careful search of the blood revealed the presence of malarial parasites. The patient was given 10 grains of quinine sulphate daily for sixty days and has not had a recurrence of hemorrhage since beginning this treatment in August, 1922.

All the foregoing simply emphasizes the fact that patients presenting symptoms referable to the digestive tract must be studied as a whole if we are to avoid errors in diagnosis.

A DIFFERENTIAL CLINICAL SIGN OF APPENDICITIS*

By GEORGE E. THOMPSON, M.D.,
Inman, S. C.

The classical signs of pain, tenderness and rigidity at McBurney's point are common medical knowledge in the diagnosis of appendicitis.

Flexion of the thigh with simultaneous extension of the leg to ascertain whether pain is produced in the same region is also frequently employed.

However, there are cases when one or more of the above symptoms may be absent or misleading, and I wish to describe a simple procedure which has occasionally been of help to me in reaching a conclusion.

This consists in merely having the patient kick an object with the right foot. If in bed, this may be a magazine or pillow held above the right extremity. If the patient is ambulant, a chair, table or other furniture may be used for the purpose. The psoas and iliacus being brought under suddenly increased tension, when the sign is positive, there is acute pain in the region of the appendix, the amount of pain depending somewhat on the force of the kick and the pathological condition.

Pain may sometimes be produced in this manner when it is not complained of as the result of simple flexion of the thigh.

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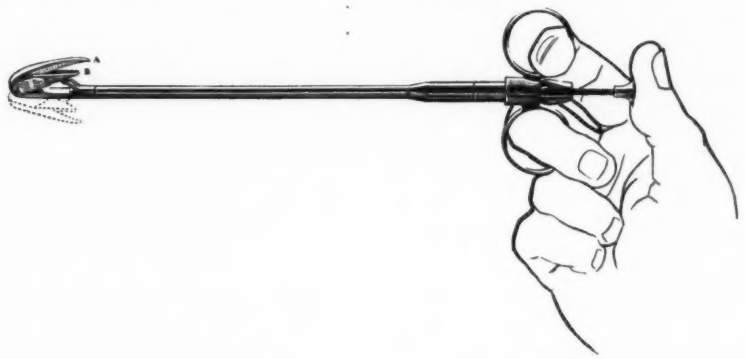
A NEW INSTRUMENT FOR DRAINING CRYPTS OF MORGAGNI*

By J. H. Dodson, M.D., F.A.C.S.,
Mobile, Ala.

With this instrument crypts of Morgagni can be permanently drained through the anoscope without relaxing the sphincter muscle. It enables the surgeon to operate upon these structures when they are in their natural shape and in their natural anatomical location. Only a few drops of a local anesthetic are necessary. That part of the instrument marked "A" is used as a probe. It enters the crypt and at the bottom of the pocket the point is brought through the valve wall until it can be seen within the anal canal. Then with one stroke of the thumb the two blades marked "B" completely remove an entire section of the valve wall. This is done with a minimum of surgical trauma. The edges of the wound are straight and there are no tags left to interfere with drainage. The universal handle enables one to operate upon crypts in any part of the anal circumference without changing the position of the hand.

*Read in Section on Gastroenterology, Southern Medical Association, Twenty-Sixth Annual Meeting, Birmingham, Alabama, November 15-18, 1932.



STONES IN THE URETER*

By A. L. Atwood, M.D.,
Birmingham, Ala.

The case I am going to report is one of stones in the ureter. It is a rare condition of complete blockage of the ureter by stones, if my diagnosis is correct. It is a condition that I did not believe possible. There may be, and I expect will be, some criticism of the way that this case was handled. The patient refused to be operated upon and the end-results may prove that she was right.

I saw the patient first with Dr. James Alto Ward on April 1, this year. She had been under his care for about two weeks. I will give you her history as she gave it to him. The main factors are as follows: her family and personal history revealed nothing of significance up to two and a half years previously, when her present illness started. She was a white woman, age twenty-seven, married twice, first at the age of fifteen, the second time at the age of twenty-one. She had one child now nine years of age and healthy. Her general physical examination was negative except for tenderness in the left kidney region and along the course of the ureter and bladder. Pelvic examination was negative except that there was leucorrhea which had followed Neisserian infection of five years before. The urine contained two-plus albumin and many pus cells. Otherwise, it was negative. The blood showed a secondary anemia, no malaria; the Wassermann and Widal were negative. Repeated smears for gonococci were negative. She gave a history of having had attacks for the preceding two and one-half years at intervals of from two weeks to three months with pain in the abdomen, particularly the left side, usually in the region of the left kidney and radiating downward toward the bladder. Occasionally there was nausea and vomiting. The attacks occurred at irregular intervals and usually during strenuous exercise such as dancing or swimming. These attacks were never severe enough to keep her in bed long. She never had blood in the urine. She had been treated by various physicians, some for malaria and some for salpingitis, and a bilateral salpingectomy had been advised, but she refused an operation. Two weeks before Dr. Ward saw her she was quite sick with one of these attacks, having chills, fever, and other symptoms. Dr. Ward made a diagnosis of pyelitis, cystitis and possibly a stone in the ureter.

X-ray flat plate showed a shadow in the region of

*Read in General Clinical Session, Southern Medical Association, Twenty-Sixth Annual Meeting, Birmingham, Alabama, November 15-18, 1932.

the upper part of the left ureter and another shadow in the region of the lower part of the same ureter. There was also a larger circular area in the region of the lower pole of the right kidney. All of these shadows suggested stone. The one on the right might be a calcified gland outside the urinary tract. In my opinion it was rather low to be in the kidney. The opinion of the radiologist was that it was a calcified gland; another, that it was a stone in the lower pole of the kidney.

An intravenous pyelogram was made with iopax. No dye came through the left kidney, none showed in the pelvis, yet it was very plain on the right. Diagnosis of obstruction on the left side was made. I cystoscoped the patient and tried in every way that I could to pass the lower stone in the left ureter, but could not. I injected novocaine, then sterile olive oil and tried the smallest filiforms that I had, but could get nothing by. I then introduced a No. 7 catheter up to the lower stone and a picture was made. I injected sodium iodide before the picture was made, hoping that some of that might get by the stone, but it did not. Repeated intravenous injections of indigo carmine were given, watching the ureteral orifices each time for the dye to come through, but none came through the left side. Dr. Ward and I thought that this was a functionless or dead kidney. Nephrectomy was considered, but as the symptoms had subsided and the patient was gaining, we decided to wait until the kidney gave her further trouble. She left town and was not under my observation until September 10, when she came to my office. I cystoscoped her, could not get by the lower stone, and no dye came through the left side at that time. I persuaded her to come to the Hillman for further study, which she did on September 17. I cystoscoped her three times at two-day intervals before I could pass the lower stone. The first time I was able to get by it was on September 21. I passed a small filiform by it and left it in for twenty-four hours. The next time I was able to get two filiforms by and the next time three filiforms were introduced. I was then able to get a small stiff bougie by the lower stone.

At that time indigo carmine was used again and for the first time since she had been under my observation the dye came through. Pictures made when she entered the hospital showed that the upper stone was smaller and the lower stone was larger than in the first picture. This led me to believe that the upper stone was distintegrating and that the sand was gravitating downward and attaching to the lower stone. These pictures have been misplaced. I should like to have them to show you to verify this. A No. 6 catheter was passed next and left in place for twenty-four hours. Now, I am able to pass a No. 8 without difficulty. The lower stone has broken up and passed. In the last picture, on November 12, the upper stone was much smaller and it should pass soon. The function on November 8, thirty minutes after intravenous injection of phenolsulphonephthalein, was, for the right 30 per cent, and the left 20 per cent.

I should like to know whether this was a completely functionless or dead kidney from April to September, which started functioning soon after the obstruction was removed, or whether the kidney functioned enough when not under my observation to keep it alive.

It is fortunate for the patient that the left kidney was not removed in April, as the right kidney has been giving her trouble for the past two weeks. The organisms cultured from the left kidney were staphylococci.

The main object in presenting this case is to demonstrate the importance of conservatism in nephrectomies in cases of apparently functionless kidneys whose injury is caused by obstruction. As this case demonstrated, an apparently functionless kidney with a ureter which was completely blocked for many months may resume function when the obstruction is removed.

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EFFECTS OF FEVER TEMPERATURES UPON THE SPIROCHETE OF SYPHILIS

One of the most watched medical methods of the past fifteen years has been the malaria treatment of advanced syphilis and general paresis, introduced by Wagner-Jauregg in 1918. The rationale of the beneficial effects which are claimed has been much discussed. The contagious diseases, such as measles and scarlet fever, which confer a lasting immunity, are usually characterized by a period of high temperature; and those which confer no immunity, such as tuberculosis and syphilis, are accompanied by slighter temperature elevations. It is suggested that malarial infection affects the course of general paresis favorably because of the fever which it induces in the tissues: that heat directly or indirectly aids in the destruction of the spirochetes. It has also been suggested that the malarial plasmodium itself has a specific effect in raising the resistance of the body, that it stimulates the reticulo-endothelial system.

Since infection with the plasmodium of benign tertian malaria causes a disease of high temperatures, which induces very little immunity to reinfection, either explanation is very open to attack. On empirical grounds, however, malarial inoculation and also high temperatures through diathermy have been extensively employed in general paresis and in certain other forms of syphilis, and reports of the beneficial effects continue to appear. Several micro-organisms have been employed for the induction of fever, and various instruments have been presented for the maintenance of human temperature at a constant high point.

What logical grounds are there for the belief that the *Treponema pallidum* is inactivated by exposure to temperatures a few degrees above the body normal? Are temperatures which will injure the organism of syphilis harmful to the host? These questions have been studied recently at the University of Rochester, New York.[1]

An attempt was made to determine what temperatures are actually spirocheticidal *in vitro* and how long an exposure at a given temperature is necessary. The thermal death time of *Treponema pallidum* outside the body was measured as follows:

Young rabbits were infected with laboratory strains of the spirochete of syphilis. After development of the early lesions, the testes were removed, extracted with saline, and the extract put into a number of glass vials which were immersed in water baths at temperatures from 37° Centigrade (normal) to 42° (or 107.6° Fahrenheit). Specimens were withdrawn from the vials at intervals and injected into susceptible animals to test the infectivity. It was found that the spirochetes kept very well in the testicular extract at body temperatures and even at considerably lower temperatures. They remained infective after eight hours at room temperature. They ceased to be infective, the *Treponema pallidum* was apparently destroyed, if they were kept for five hours at 39° Centigrade; for three hours at 40°; and for two hours at 41°. A temperature of 41.5° Centigrade rendered the material non-infectious in one hour.

The thermal death time of the organism was so short as to suggest that induced fever might be useful in the treatment of human syphilis.

The same workers studied the effects of frequent elevations of temperature upon young and growing animals, which should be more susceptible than adults to treatment of this kind.

Temperature elevations were developed by

1. Boak, R. A.; Carpenter, C. M.; and Warren, Stafford L.: Studies on the Physiological Effects of Fever Temperatures. Jour. Exper. Med., 56:719-751, Nov., 1932.
Carpenter, C. M.; Doak, R. A.; and Warren, Stafford L.: Idem., p. 751.

short wave, high frequency radiation, that is, by short radio waves. Rabbits one to six months old were kept at body temperatures of 41 to 42° Centigrade for more than an hour from two to five times per week during a period of several months. Growth, mating, fertilization and the size of the litters were observed.

The treatment did not interfere with normal development. On the contrary, the authors claim a beneficial effect from the radiation. Rabbits exposed to the short wave fevers showed in the majority of cases a greater percentage weight gain than did the control litter mates. They matured more rapidly. They averaged smaller litters, of larger rabbits, than did the controls: they bore an average of 5.5 young per litter, with an average weight of 41 grams, while the untreated females averaged 7 per litter with an average weight of 36.5 grams. Repeated elevations of body temperature within the prescribed limits, they conclude, is a safe procedure.

The same workers have previously shown that short repeated fevers administered to rabbits within a week after the injection of *T. pallidum* prevent the development of syphilitic lesions in a majority of the animals. They now report that rabbit syphilis apparently may be cured at any stage by the same method. One febrile period of 6 hours at a temperature of 41.5 to 42° C. was sufficient to destroy the organism in the rabbit.

Their evidence, then, supports the belief that elevations of body temperature may be induced which will destroy *T. pallidum in vivo* without injuring the host.

CAUSE OF RHEUMATIC FEVER

Recently Coburn and Pauli,[1] of Columbia University College of Physicians and Surgeons, have made a series of studies of rheumatic fever. They indicate a relationship between a hemolytic streptococcus and this disease, not, however, a very simple one. They have shown that the organism in question is to be found in the throats of many normal children. It tends to occur more frequently in the throats of the poor (in their series in 10 per cent) than in those of the well-to-do (1 per cent). Inflammatory rheumatism also occurred twenty times more frequently among poor children than among the well-to-do, and always in those who harbored this streptococcus in their throats.

In a series of fifty student nurses whom Coburn and Pauli examined there was an epidemic of sore throat with *Streptococcus hemolyticus* infection, and four of the nurses subsequently developed rheumatic fever. The symptoms occurred approximately ten days after complete recovery from the throat infection.

All other cases of rheumatic fever studied had an attack of hemolytic streptococcic throat infection about ten days before the development of the rheumatic symptoms. Ambulant cases which remained free of respiratory symptoms remained free of rheumatic symptoms as well, and a reactivation of the rheumatic process occurred regularly after a recrudescence of the throat infection.

Throat infections of this type were more numerous in cold and changing weather, and the incidence of rheumatic fever followed the same weather curve.

The sera of acutely ill patients were examined by a number of immunologic tests. Precipitins and agglutinins were determined and complement fixation reactions were done in rheumatic fever and in various types of streptococcic infection. The blood serum of an acutely ill rheumatic fever patient rarely failed to give a strong precipitin reaction with the streptococcus antigen. Individuals who had streptococcal throat infection but escaped attacks of rheumatic fever showed no precipitins. Several individuals with recurrent attacks were studied bacteriologically and immunologically over a long period. Their sera contained no precipitins for the streptococcus so long as the disease was quiescent, but precipitins reappeared with the recrudescence of symptoms.

The combined evidence, according to the Columbia workers, indicates that the infectious agent initiating the rheumatic symptoms is *Streptococcus hemolyticus*, and that the symptoms occur after subsidence of the acute throat infection during the period when the immune reactions are high.

The diseases caused by streptococci have not lent themselves readily to specific therapeutic or prophylactic measures, except in the case of scarlet fever, and this is a disease which normally itself confers an immunity. Rheumatic fever, like the fever of puerperal septicemia, confers no immunity. The above contributions to the understanding of the disease offer little hope of a more rapid specific approach to its

1. Coburn, Alvin F.; and Pauli, Ruth H.: Studies on the Relationship of Streptococcus Hemolyticus to the Rheumatic Process. Jour. Exper. Med., 56:609-676, Nov., 1932.

control. Individual immunity, upon which at present hangs the chief hope of relief, is a very variable factor, and one which is little controllable.

Favorable climatic conditions affect inflammatory rheumatism more specifically than medication. This disease is seldom seen in the tropics and its subjects are usually benefited by living in a warm climate.

Since the 1890's specific microbic causes of this disease have been described. In 1891 it was reported that a particular bacillus was always to be found in rheumatic lesions. In the same decade a diplococcus and a micrococcus were likewise depicted as fulfilling the requirements for a causative agent. Poynton, of London, in McCrae's "Osler," in 1926, shows microphotographs of an organism in a rheumatic nodule, the *Diplococcus rheumaticus*, which he believes to be causative. Rosenow in the last decade has produced studies of a streptococcus with which he induced symptoms of inflammatory rheumatism in animals; and a number of other workers have associated a streptococcus with the disease. A large number of bacteria, of course, are capable of inducing arthritis in laboratory animals.

The original postulates of the founders of bacteriology were that the organism must be observed with constancy in the important lesions of the disease; upon isolation it must produce similar lesions in a susceptible animal; and it must be capable of isolation from the experimental lesions in pure culture. The streptococcus of Coburn and Pauli does not attempt to fulfill the old requirements.

Bacteriology of this century is a much less simple science, however, than it was in the last. It has been greatly advanced and complicated by immunology. The studies of the Columbia workers deserve to be seriously considered until they have been disproven. The emphasis upon the factor of lowered resistance, upon study of the immune reactions, and upon the relation of poverty to the disease are important contributions.

GLEANINGS FROM RECENT JOURNALS

A Dietary Polycythemia.—Minerals of the ration have received medical attention, particularly since the reports of various forms of animal anemia due to deficiency of inorganic elements. Milk anemia of rats is said to be caused by lack of iron and copper in milk, which is otherwise a perfect food. Excess cobalt has been reported to produce a polycythemia. Swanson and Smith,[1] of Yale, have experimented with diets devoid, not of one or two minerals, but of nearly all the inorganic elements. On this unusual ration rats could be maintained at a constant weight for a time. A characteristic blood picture developed after about eight weeks. The number of the red cells increased and their size diminished. The total amount of hemoglobin was reduced, though the amount per cell remained normal.

A dietary means of inducing an unusual experimental condition, polycythemia, with small blood cells, is thus described.

Rickets and the Calcium of the Brain.—The normal rat brain, according to Hess[2] and his coworkers at Columbia University, contains about 182 milligrams of calcium. The quantity of calcium is considerably reduced in rickets, in which condition an average of about 59 milligrams is to be found. This reduction of the brain calcium is to be observed after several types of rickets-producing diets, including a high calcium diet. The calcium content of the brain was not affected by parathyroidectomy, which reduces the blood calcium, or by injections of parathormone, which increases the blood calcium. It rose slowly after restoration of the animal to a normal diet.

This change in the quantity of an important mineral in the brain would necessitate changes in brain cell reactions in rickets, and suggests the probability of variations in the mental activity of individuals with this very common disease.

A Drug of the Future: Purification of Progestin.—The study of corpus luteum hormone or hormones, since there may be more than one, in the past three years has contributed greatly to the knowledge of female physiology. The yellow body of the ovary is important in the preparation of the uterine lining for pregnancy, and it aids in the nutrition of the embryo. It is necessary for normal menstruation. It is believed that it should be effective in the treatment of certain types of menorrhagia. Unfortunately commercial preparations of the active product are not available for clinical investigations. A simplified method of preparation is described by a pioneer worker[3] who has been

1. Swanson, P. P.; and Smith, A. H.: Inorganic Salts in Nutrition. Jour. Biol. Chem., 98:479, Nov., 1932.
2. Hess, A. F.; Gross, J.; Weinstock, M.; and Berliner, F. S.: The Calcium and Phosphorus Content of the Brain in Experimental Rickets and Tetany. Idem., p. 625.
3. Allen, W. M.: The Preparation of Purified Progestin. Idem., p. 591.

engaged in the study of this product over a long period: that is, the method is described as being simpler than the older methods. A glance at the simplified technic will serve to show the difficulties under which the physiologist labors in his attempts at production of an abundant supply. Among the steps involved are three extractions with boiling alcohol and two precipitations with acetone. The material is then frozen in wood alcohol, washed with various solvents and goes through several other precipitations. To test its potency, it is injected into a mature castrated female rabbit, the uterus is subsequently removed and examined for evidence of proliferation. Unlike theelin and the anterior pituitary sex hormones now available, progestin is not obtained from pregnancy urine, amniotic fluid or placenta, only from the actual yellow body of the fresh ovary.

From the scarcity of the source material and the difficulty of purification, it would seem that an abundant supply of this hormone for clinical work will not soon be forthcoming.

Book Reviews

Alcohol and Man: The Effects of Alcohol on Man in Health and Disease. Edited by Haven Emerson, M.D., De Lamar Institute of Public Health, Columbia University. 451 pages. New York: The Macmillan Company, 1932. Cloth, $3.50.

The unprejudiced physician, or intelligent unbiased layman, who desires to know the scientific facts regarding the effects of alcohol upon the human body in health and disease will read with absorbing interest "Alcohol and Man," edited by Dr. Haven Emerson. The eminent clinicians, physiologists, pharmacologists, pathologists, psychologists, psychiatrists, statisticians and actuaries who have collaborated with Dr. Emerson in the preparation of this much needed book on a problem of vital interest at this time have expressed their views only after a thorough study of the various phases of alcohol in its relation to the human body. Therefore, what they say may be regarded as authoritative. Hemwich, Yale University physiologist, states unqualifiedly that alcohol in all concentrations is a depressent, both motor and sensory, which interferes with accuracy and efficiency in every undertaking. He asserts, however, that alcohol is oxidized as a food, though he does not advise its use on account of its food value because of its toxic properties. Bogan, California pathologist, in a chapter on "The Human Toxicology of Alcohol," says: "No other poison causes so many deaths, or leads to or intensifies so many diseases, both physical and mental, as alcohol in the various forms in which it is taken." He concludes by saying: "Alcohol is the most dangerous poison widely included in the human diet."

Joseph Miller, Chicago University Professor of Medicine, in discussing alcohol in pneumonia, concludes: "There is no experimental or clinical evidence that supports the view that the therapeutic use of alcohol should affect pneumonia favorably." Lawrason Brown, Saranac Lake, New York, discussing alcohol in tuberculosis, says: "In the sanatorium treatment of pulmonary tuberculosis in this country alcohol is rarely prescribed. At the Trudeau Sanatorium it is practically never used." In summarizing the opinions of clinicians regarding the use of alcohol as a therapeutic agent Christian says: "It seems a fact that in both private and hospital practice the utilization of alcohol and alcoholic beverages by the better trained physicians has decreased greatly and is continuing to decrease."

The chapter on the psychological effect of alcohol in man by Miles, of Yale University, contains much illuminating information, particularly the reference to alcohol and the psychology of accidents.

Alcohol as a psychiatric problem is discussed by Adolph Meyer, of Johns Hopkins, who speaks of alcohol as a "habit forming chemical entity," and further says: "Alcohol clearly enters in many ways as a pathogenic factor into disturbances of the health, happiness and efficiency of man." Dr. Meyer says: "A vast amount of human happiness and misery is at stake, with alcohol the essential component that is absolutely within the control of man, more than is the cause of any other form of illness and mental disease of a type that mankind can eliminate if he wants to."

The scientific, sometimes unvarnished, truth regarding the effects of alcohol on the human body may be found in "Alcohol and Man." It is a distinct and valuable contribution to a subject on which the public has absorbed a vast amount of misinformation.

Clinical Endocrinology of the Female. By Charles Mazer, M.D., F.A.C.S., Assistant Professor of Gynecology and Obstetrics, Graduate School of Medicine, University of Pennsylvania, Philadelphia; and Leopold Goldstein, M.D., Demonstrator of Obstetrics, Jefferson Medical College. 518 pages with 117 illustrations. Philadelphia and London: W. B. Saunders Co., 1932. Cloth, $6.00.

Organotherapy, according to Dr. P. Brooke Bland, who has written the introduction to this book, was until recently quite devoid of accomplishment. During the last few years it has acquired a scientific basis. This volume contains an excellent historical review of the subject. It has very good chapters on the ovarian hormones, on the anterior pituitary hormones, on the thyroid, adrenal and other endocrines of concern in gynecology. The histology and physiology of menstruation are fully discussed. There are chapters on menstrual disorders of women and their clinical management, and on sterility. The section on pregnancy tests gives the technics in detail. The authors attempt a strictly clinical view of their subject and they possess the gift of clear writing.

The book is excellent as a review of a great volume of important new work. The authors are logical, and not extremists. Clinical measures in endocrine disorders are in such a state of flux that it is probable the sections on therapy will be subject to early revision. The progressive gynecologist will find it a good reference.

The History of Dermatology. By Wm. Allen Pusey, A.M., M.D., LL.D., Professor of Dermatology Emeritus, University of Illinois; Sometime President of the American Dermatological Association and of the American Medical Association. 223 pages, with 33 illustrations. Springfield, Illinois: Charles C. Thomas, publisher, 1933. Cloth, $3.00.

Pusey's "History of Dermatology" is a model of its kind; and it is the only history of dermatology in the English language.

The exigencies of the subject require that in large measure biography of the great leaders and organizers of cutaneous medicine be developed. Pusey's limpid and facile style serves well in this task, as well as his sympathetic imagination; and to apply to the author a phrase he more than once uses to describe certain of his subjects, his encyclopedic mind confers a richness upon his work which no mere narrow scholar ever attains.

Illustrations are numerous, rare in character, and excellent. Attractively bound, the book does not need, like many of its companions of today, to depend upon a gaudy paper cover to hide drab and cheap binding.

Anatomy of the Brain and Spinal Cord. By William W. Looney, A.B., M.D., Professor of Anatomy, Baylor University College of Medicine, Dallas, Texas. 370 pages with 153 illustrations. Second edition, revised. Philadelphia: F. A. Davis Company, 1932. Cloth, $4.50.

The writer recognizes the fact that the physiology and anatomy of the brain, spinal cord and sympathetic nervous system cannot be separated. As in his first edition, these two are presented together.

This text makes neuro-anatomy a much simpler subject than most students and practitioners have been willing to admit it to be. This work should remove the veil of mystery and despair which so many have cast on neuro-anatomy. Professor Looney has presented in simple, readable and readily digested form the facts of the physiology and anatomy of the central nervous system.

The illustrations, which are indispensable to anatomy, are illuminating and valuable. The chapter on the sympathetic nervous system is simple and concise. An interesting and valuable chapter is the concluding one on practical consideration, including many appropriate case reports. This is a helpful and unusual addition which most anatomies omit.

Injuries of the Eye. Diagnosis and Treatment, Forensic Procedures and Visual Economics. By Harry Vanderbilt Wurdemann, M.D., Sc.D., F.A.C.S., Colonel, Medical Reserve Corps; Flight Surgeon Air Corps, U. S. Army; Medical Examiner, Aeronautics Branch, U. S. Department of Commerce, Seattle, Washington. Second Edition. 900 pages with 236 illustrations and 10 color plates. St. Louis: The C. V. Mosby Company, 1932. Cloth, $13.50.

This book well illustrates the extreme to which specialization in medical practice has come. A volume of 900 pages is devoted exclusively to injuries of the eye and there is not one page that has not something of definite value. The book is divided into three very unequal parts. The first 350 pages, embracing seventeen chapters, treat of general eye injuries; and this portion of the volume is of intense interest not only to the eye specialist, but could be read with great profit by the general physician. In fact, the chapters on "Etiology of Injuries to the Eye," "Mechanism of Ocular Injuries" and "Prophylaxis of Injuries to the Eye" might wisely be embraced in a pamphlet for general distribution to all industrial workers.

Part II, covering thirteen chapters and more than 400 pages, has to do with "Injuries of the Special Structures of the Eye." Here one finds an amazing amount of material useful to the specialist. Indeed, the practitioner with many years' experience in industrial accidents is surprised to find so many valuable suggestions and new ideas. The chapters on "Injuries of the Sclera and Corneoscleral Margin," "Injuries of the Retina" and "Injuries of the Orbit Contents and Walls" are especially rich in valuable suggestions.

Part III on Forensic Medicine contains a chapter on "Medicolegal Phases," embracing such subjects as malingering, simulation, self-inflicted damage and the physician in court. It contains also a chapter on "Protective Legislative Pensions and Accident Insurance." It gives a digest of the laws of various states and countries. The last chapter on "Visual Economics" discusses "method for scientific estimation of economic damage" and will prove especially helpful to physicians faced with these obscure problems.

The book is well illustrated and has a splendid index. After a careful review one finds everything to commend and only one to criticize. It is a pity that a book so valuable for frequent reading and frequent reference should have such weight. The reviewer regrets that is is not a light-weight volume like those of the English publishers.

Skin Diseases and Nutrition, Including the Dermatoses of Children. By Erich Urbach, M.D., Dozent in Dermatology at the University of Vienna; First Assistant to Prof. W. Kerl at the University Clinic for Skin and Venereal Diseases. 242 pages, illustrated. Wien IX, Spitalgasse 1B: Verlag Wilhelm Maudrick, publisher, 1932. Cloth, $7.00.

This book may unhesitatingly be accepted for what the title claims it to be.

The information given is specific and is offered in practical detail. The vague generalities which make it a trial to use most books on nutritional therapy are largely avoided.

The bibliography is enormous. References to the literature appear at the bottom of each page, instead of at the end of each chapter, an arrangement never to be sufficiently praised in any scientific work.

A tyro in cutaneous medicine would feel after going through this volume that most of his future dermatological problems could be solved by diets. The experienced dermatologist will inevitably judge that the author's enthusiasms for his subject have led him too fast. But for both there is much of profit in this work, as well as for the lay practitioner who usually welcomes succinct dogmatism in therapeutic advice in special fields, because it saves time and makes information easy to acquire.

Diseases of the Spinal Cord. By William B. Cadwalder, M.D., Professor of Clinical Neurology, University of Pennsylvania Medical School; Neurologist to the Presbyterian Hospital, Philadelphia; Consulting Neurologist, Bryn Mawr Hospital, Bryn Mawr, Pa. 204 pages with 72 illustrations. Baltimore: The Williams & Wilkins Company, 1932. Cloth, $5.00.

The first five chapters of this text-book are devoted to a discussion of the basis of diagnosis of spinal cord diseases. First of these is a brief review of the neuron theory; the second, of the anatomy of the spinal cord. The third, fourth and fifth chapters deal with reflexes and topographical diagnosis.

The last ten chapters are devoted to diseases. Each disease is treated as to definition, etiology, pathology, symptoms, course, prognosis and treatment. The chapter on compression of the spinal cord would in itself make this an invaluable text.

The illustrations are numerous and excellent. The 20-page bibliography at the end of the book is a valuable reference to the current literature of spinal cord diseases.

Surgery with Special Reference to Podiatry. By Edward Adams, M.D., Professor of Surgery, the First Institute of Podiatry of New York. Second edition. 480 pages. International Journal of Surgery Co., New York, 1932.

Old chapters have been rewritten and revised and five additional ones have been added to this edition. These chapters are on Surgical Aids to Diagnosis; Ulcers; Bandages; General Anesthesia; and After Treatment of Surgical Conditions. A large part of the material presented has to do with general surgery rather than podiatry. The author defends this inclusion, stating: "This, however, is no more true of podiatry than any other specialized branch of surgery which requires a knowledge of the anatomy and physiology of the body."

The book is by no means complete. The subjects are discussed in a rather general and at times superficial manner. This is not only true of the general surgery, but also of those parts on podiatry. Neither iodine nor mercurochrome is mentioned in the chapter on antiseptics and although the Wassermann reaction is described in detail, no mention is made of the Kahn test which is replacing it. The practitioner of medicine will find little of value in this text.

Management of the Sick Infant. By Langley Porter, B.S., M.D., M.R.C.S. (Eng.), L.R.C.P. (Lond.), Professor of Clinical Pediatrics, University of California Medical School; and William E. Carter, M.D., Instructor in Pediatrics, University of California Medical School. Fourth Revised Edition. 763 pages, illustrated. St. Louis: The C. V. Mosby Company, 1932. Cloth, $8.00.

The fourth edition of this text needs little introduction to the medical profession. The work retains the characteristics of the previous editions, being divided into three parts. The first considers the subject in general and discusses various symptoms that may arise and their possible causative factors; the second discourses on the different systems and tracts and the diseases to which they are disposed; and the third gives therapeutic methods, formulae and drugs.

Most striking is the lack of illustrations except in the chapter on methods. The grouping of the therapeutic procedures in a single chapter offers an advantage if the book is to be used mainly for reference. Otherwise it is disconcerting to be reading and come upon one of those inevitable references to a distant page. The writers have given transfusions prominence as a *sine qua non* in the treatment of the sick infant, especially the dehydrated and the malnourished. On page 122 the ferric chloride test is given as "certain" for the presence of diacetic and oxybutyric acid in the urine. Later qualification is made in regard to alkalinization, but no mention is made of phenol, antipyrin and the salycylates as giving a similar reaction.

The practitioner is confronted by many problems and perplexities when caring for the sick infant. This text with its excellent diagnostic procedures and practical methods will prove helpful.

Southern Medical News

GENERAL

The Panamerican Medical Association, Fourth Congress, will be held in Dallas, Texas, Tuesday, Wednesday, Thursday, Friday and Saturday, March 21-25. The membership of the Panamerican is drawn largely from Latin-American countries and the United States. Medicine and surgery in its many phases will be presented by physicians from all the countries from which the Panamerican draws its membership. The first Congress was held in Havana, Cuba, in 1929; the second in Panama, Republic of Panama, in 1930; and the third in Mexico City in 1931. Dr. Francisco M. Fernandez, Havana, Cuba, is President, and Dr. J. E. Lopez Silvero, Malecon 15, Havana, Cuba, is Executive Secretary. Dr. John O. McReynolds, Mercantile Building, Dallas, Texas, is President (General Chairman) of the Congress.

The Dallas Southern Clinical Society, Fifth Annual Spring Clinical Conference, will meet at the Baker Hotel, Dallas, Texas, Monday, Tuesday, Wednesday, Thursday and Friday, March 27-31, five days of postgraduate study. All branches of medicine and surgery are covered in the program. Both wet and dry clinics are being prepared. Dr. J. L. Goforth is President, Dr. W. G. Reddick, Secretary, Dr. Curtice Rosser, Director of Clinics, and Dr. J. Shirley Sweeney, Chairman of the Executive Committee. Program and other information are available from the Secretary, 610 Medical Arts Building, Dallas, Texas.

The Southeastern Surgical Congress, Fourth Annual Assembly, will be held at the Biltmore Hotel, Atlanta, Georgia, Monday, Tuesday and Wednesday, March 6, 7 and 8. The preliminary program gives the names of a number of outstanding surgeons of the country and indicates a splendid meeting. Some clinics are being planned. Dr. Frank K. Boland, Atlanta, Georgia, is President, and Dr. B. T. Beasley, Doctors Building, Atlanta, Georgia, Secretary.

The Mid-South Post-Graduate Medical Assembly will hold its forty-ninth annual meeting at Memphis, Tennessee, Tuesday, Wednesday, Thursday and Friday, February 14-17. The scientific sessions, round table discussion sessions and the exhibits will be held at the headquarters hotel, the Peabody Hotel. The preliminary program gives the names of some of the leading men in medicine and surgery throughout the country. Dr. A. F. Cooper, 10 South Main Street, Memphis, Tennessee, is Secretary of the Assembly.

Dr. William B. Coley, New York, New York, was given a testimonial dinner by the Medical Board of the Memorial Hospital, New York, at the Waldorf Astoria Hotel on his birthday anniversary, January 12. Dr. Coley has recently resigned from the staff of the Memorial Hospital after forty-one years of continuous service in this institution. He has many friends and admirers throughout the South. Among the many associations with which he is affiliated is the Southern Surgical Society.

ALABAMA

The Colbert County Medical Society has elected the following officers for the coming year: Dr. J. P. Long, Sheffield, Presi-

dent; Dr. R. D. Wright, Leighton, Vice-President; and Dr. W. T. Burkett, Tuscumbia, Secretary-Treasurer.

The Lawrence County Medical Society has elected the following officers for 1933: Dr. J. K. Clarke, Courtland, President; Dr. J. W. Fennell, Mt. Hope, Vice-President; and Dr. R. E. Harper, Moulton, Secretary-Treasurer.

The Madison County Medical Society has elected the following officers for 1933: Dr. W. C. Hatchett, President; Dr. M. M. Duncan, Vice-President; and Dr. T. E. Dilworth, Secretary-Treasurer; all of Huntsville.

The Montgomery County Medical Society has elected the following officers for the coming year: Dr. Robert Parker, President; Dr. Haywood Bartlett, Vice-President; Dr. J. L. Bowman, Secretary; and Dr. F. C. Stevenson, Treasurer; all of Montgomery.

The Morgan County Medical Society has elected the following officers for 1933: Dr. W. H. Anderson, Decatur, President; Dr. Frank Emens, Trinity, Vice-President; and Dr. E. R. Emens, Decatur, Secretary-Treasurer.

Dr. Porter Stiles, Birmingham, has been elected an associate fellow of the American Laryngological Association.

Dr. J. P. Chapman, formerly of Birmingham, has moved to Selma, where he is associated with the Marcus Skinner Clinic.

Dr. Adrian S. Taylor, formerly of Birmingham, has gone to Rochester, New York, where he has accepted a position as Superintendent and Surgeon at Clifton Springs Sanitarium and Clinic.

Deaths

Dr. Clara Elizabeth Atkinson, Fairhope, aged 87, died October 16.

Dr. Toxey Hannon Sewell, Tarrant, aged 39, died December 5 in a Birmingham hospital of encephalitis.

Dr. R. W. Woods, Jasper, aged 77, died November 9.

Dr. William Josiah Clarke, Russellville, aged 62, died November 25 in a Florence hospital.

Dr. John Kimbrough, Hartselle, aged 44, died October 31 of cerebral hemorrhage.

Dr. Frank Ross Sherard, Mobile, aged 62, died December 30.

Dr. J. L. Perdue, Greenville, died December 17.

Dr. Armistead L. Hayes, Notasulga, aged 44, died December 14.

ARKANSAS

The Cross County Medical Society has elected the following officers for 1933: Dr. Thomas Wilson, President; Dr. L. H. Lipsey, Vice-President; and Dr. Ruffin Longest, Secretary-Treasurer; all of Wynne.

The Faulkner County Medical Society has elected the following officers for the coming year: Dr. H. E. Cureton, President; Dr. Louis S. Dunaway, Vice-President; and Dr. Marcus T. Smith, Secretary-Treasurer; all of Conway.

The Jefferson County Medical Society has elected the following officers for the coming year: Dr. T. J. Cunningham, President; Dr. W. M. Chavis, Vice-President; and Dr. Grace Tankersley, Secretary-Treasurer; all of Pine Bluff.

The Mississippi County Medical Society met in Blytheville recently and elected the following officers for 1933: Dr. A. M. Washburn, Blytheville, President; Dr. J. A. Luckett, Dell, Vice-President; and Dr. F. D. Smith, Blytheville, reelected Secretary-Treasurer.

The Pulaski County Medical Society has elected the following officers for 1933: Dr. S. C. Fulmer, President; Dr. Paul Mahoney, Vice-President; Dr. E. H. White, reelected Secretary; and Dr. William R. Bathurst, reelected Treasurer; all of Little Rock.

The Saline County Medical Society has elected the following officers for 1933: Dr. Curtis W. Jones, Benton, President; Dr. W. W. Ward, Alexander, Vice-President; and Dr. Thomas C. Watson, Benton, Secretary-Treasurer.

The Searcy County Medical Society has elected the following officers for 1933: Dr. J. O. Cotton, Leslie, President; Dr. J. O. Leslie, Marshall, Vice-President; and Dr. Sam G. Daniel, Marshall, Secretary-Treasurer.

The Sevier County Medical Society has elected the following officers for the coming year: Dr. C. E. Kitchens, DeQueen, President; Dr. J. C. Graves, Lockesburg, Vice-President; and Dr. Isaac C. Jones, DeQueen, Secretary.

The Washington County Medical Society has elected the following officers for the coming year: Dr. F. R. Morrow, Fayetteville, President; Dr. Preston L. Hathcock, Fayetteville, Vice-President; and Dr. Fount Richardson, Fayetteville, Secretary-Treasurer.

Dr. E. D. McKnight, Brinkley, has been elected President of the State Board of Health, and Dr. J. G. Gladden, Western Grove, has been elected Vice-President.

Dr. Robert Caldwell, Little Rock, has been reappointed Chairman of the Honorary Board in charge of operation of the State Hospital for Nervous Diseases.

Dr. H. King Wade, Hot Springs, has been installed as President of the Kiwanis Club of Hot Springs, with Dr. George E. Fletcher as Vice-President, and Dr. L. G. Martin, District Trustee.

Deaths

Dr. William Byers Case, Heber Springs, aged 61, died October 18.

Dr. Isaac J. Jones, Little Rock, aged 68, died December 27.

Dr. James Horace Lenow, Little Rock, aged 83, died December 30.

Dr. Gustavus Albert Warren, Black Rock, aged 67, died December 26 of a heart attack following injuries received in an automobile accident.

DISTRICT OF COLUMBIA

Dr. Lawrence C. Kolb, Washington, has been made Superintendent of the Federal Hospital for Mental Delinquents at Springfield, Missouri.

Dr. Robert U. Patterson, Washington, Surgeon General of the United States Army, was the guest of honor at a recent gathering of the Fauquier County Medical Society, when the Society was entertained by Dr. Stewart McBryde, Manassas, Virginia. Other Washington physicians present on this occasion were Dr. Oscar B. Hunter, Dr. John R. Lloyd, Dr. William Arthur Morgan and Dr. Charles S. White.

Dr. Hugh S. Cumming, Washington, Surgeon General, United States Public Health Service, was a speaker on the program at the meeting of the Association for the Prevention of Tuberculosis.

Edwin O. Jordan, Ph.D., Chicago, gave the second of the series of Smith-Reed-Russell Society lectures before the faculty and students of George Washington University School of Medicine.

Deaths

Dr. Stanley Marshall Rinehart, Washington, aged 65, died October 28 of uremia and chronic nephritis.

Dr. George Philip Carr, Washington, Lieutenant Commander, U. S. Navy, aged 43, died October 30 of angina pectoris.

Dr. Cuthbert Gilham, Washington, aged 67, died November 8 of cerebral hemorrhage.

FLORIDA

Dr. Edward Jelks, Jacksonville, has been reappointed the member of the Council of the Southern Medical Association from Florida for a regular Council term of three years, the appointment having been announced recently by the President, Dr. Irvin Abell, Louisville, Kentucky.

The Columbia County Medical Society has reelected the following officers for 1933: Dr. L. M. Anderson, President; Dr. R. B. Harkness, Vice-President; and Dr. T. H. Bates, Secretary-Treasurer; all of Lake City.

The Florida East Coast Medical Association has elected the following officers for the coming year: Dr. Edward Jelks, Jacksonville, President; Dr. E. C. Swift, Jacksonville, First Vice-President; Dr. H. W. Walker, Miami, Second Vice-President; and Dr. Homer Pearson, Miami, Secretary-Treasurer.

The Leon-Gadsden-Liberty-Wakulla-Jefferson County Medical Society has elected the following officers for the coming year: Dr. B. A. Wilkinson, Tallahassee, President; Dr. J. H. Pound, Chattahoochee, Vice-President; and Dr. O. G. Kendrick, Tallahassee, Secretary-Treasurer.

The Midland Medical Society has elected the following officers for the coming year: Dr. S. A. Clark, Lakeland, President; Dr. J. T. Jackson, Dade City, First Vice-President; Dr. George W. Hardy, Tampa, Second Vice-President; and Dr. Robert C. Black, Tampa, Secretary-Treasurer.

Dr. G. H. Edwards, Orlando, is the newly elected President of the Central Florida Yale Club.

Dr. S. E. Driskell, Jacksonville, has been appointed a member of the State Board of Medical Examiners.

The following Miami physicians have been elected to the staff of the Riverside Hospital at Miami: Dr. H. H. Fox, Chief of the Staff; Dr. J. M. J. Luke, Assistant Chief; Dr. Robert T. Spicer, Staff Secretary; Dr. Kenneth Phillips, Medical Chief; Dr. S. E. Chambers, Surgical Chief; and Dr. Homer L. Pearson, Chief of Obstetrics and Gynecology.

Dr. J. S. McEwan, Orlando, recently visited surgical clinics in New York City.

Dr. G. C. Tillman, Gainesville, was recently made a Fellow of the American College of Surgeons.

Dr. Jack Halton, Sarasota, was recently awarded the community service medal, presented by the Sarasota Bay Post, No. 30, American Legion, in recognition of his work in the Legion's underprivileged child clinic.

Dr. Ruth S. Hart has located at Winter Park, after completing her internship at the Tampa Municipal Hospital.

Dr. Henry E. Palmer, Tallahassee, recently entertained the Tallahassee Kiwanis Club at his home.

Dr. A. R. Beyer, Tampa, has been in New York taking a course in bone surgery at Columbia School and Hospital.

Dr. S. B. Forbes, Tampa, is attending clinics and lectures on eye, ear, nose and throat work in Vienna, Austria.

Dr. Alexander John McRae, Miami, has been appointed Superintendent of the New Nassau County Hospital, Mineola, Long Island, New York.

Nellie M. Harding has succeeded Dr. C. J. Hurlbut as Superintendent of the Bartow General Hospital at Bartow.

Dr. Francis Marion Watson, Quincy, and Miss Margaret Tatum were married in October.

DEATHS

Dr. Josiah Jackson Luke, Ellenton, aged 46, died October 28 of asthma.

GEORGIA

The Floyd County Medical Society has elected the following officers for 1933: Dr. R. C. Maddox, President; Dr. B. V. Elmore, Vice-President; and Dr. R. M. Harbin, Jr., Secretary-Treasurer; all of Rome.

The Fulton County Medical Society has elected the following officers for 1933: Dr. W. E. Barber, President; Dr. M. C. Pruitt, President-Elect; Dr. J. C. Massee, Vice-President; and Dr. Howard Hailey, Secretary-Treasurer; all of Atlanta.

The Jackson County Medical Society has elected the following officers for 1933: Dr. Laetus Sanders, Commerce, President; Dr. L. C. Allen, Hoschton, Vice-President; and Dr. J. C. Bennett, Jefferson, Secretary-Treasurer.

The Macon Medical Society (Bibb County) has elected the following officers for 1933: Dr. Thomas Harrold, President; Dr. Wallace L. Bazemore, Vice-President; and Dr. Leon D. Porch, Secretary-Treasurer; all of Macon.

The Randolph County Medical Society has elected the following officers for 1933: Dr. W. W. Crook, Cuthbert, President; Dr. A. L. Crittenden, Shellman, Vice-President; and Dr. G. Y. Moore, Cuthbert, Secretary-Treasurer.

The Walker County Medical Society has elected the following officers for 1933: Dr. B. C. Hale, Rossville, President; Dr. J. S. Alsobrook, Rossville, Vice-President; and Dr. Fred H. Simonton, LaFayette, Secretary-Treasurer.

Dr. A. D. Williams has moved from Folkston to Waycross, where he will practice pediatrics and obstetrics.

Dr. J. K. Burns, Gainesville, has been elected President of the Gainesville Kiwanis Club.

Dr. and Mrs. M. F. Haygood, Alto, were hosts recently to the members of the Habersham County Medical Society.

Dr. Webb Conn, Brunswick, is the newly elected County Commissioner of Health of Glynn County.

Dr. Everett L. Bishop has opened a laboratory in the Medical Arts Building, Atlanta.

Physicians of Lincoln County were hosts recently to members of the Richmond and Wilkes County Medical Societies.

Health officers of South Georgia met in Albany recently for a conference.

Dr. Kenneth McCullough, Waycross, formerly Chief of Staff of the Atlantic Coast Line Railroad Hospital, has opened offices in the Bunn Building in Waycross, with practice limited to general surgery.

Dr. L. Minor Blackford, Atlanta, has moved into new offices at 104 Ponce de Leon Avenue, Northeast.

Dr. Guy A. Caldwell, Atlanta, has moved into offices in the Medical Arts Building, where he will have associated with him Dr. Stanley A. Hill in the practice of orthopedic surgery.

DEATHS

Dr. John M. Poer, West Point, aged 59, died November 15 of typhus fever.

Dr. Beauregard Williams, Pelham, aged 71, died suddenly October 26 of heart disease.

Dr. Roy James Chappell, Dudley, aged 66, died November 22.

Dr. George H. Noble, Atlanta, aged 72, died October 29.

Dr. Margaret Harrison Polk, Augusta, aged 72, died October 22 of sprue.

Dr. Asbury Hull, Augusta, aged 49, died November 4 of burns received when his automobile caught fire.

Dr. Joseph P. Woodward, Buford, aged 57, died October 23.

Dr. Allen Fort Caldwell, Atlanta, aged 41, died suddenly at his office November 10.

Dr. Redding Hamilton Pate, Unadilla, aged 60, died November 25 at the home of his daughter in Macon.

KENTUCKY

Dr. C. W. Dowden, Louisville, has been appointed the member of the Council of the Southern Medical Association from Kentucky for a regular Council term of three years, the appointment having been announced recently by the President, Dr. Irvin Abell, Louisville. Dr. Dowden succeeds Dr. John H. Blackburn, Bowling Green, who, having served the constitutional limit, was not eligible for reappointment.

The Franklin County Medical Society has elected the following officers for the coming year: Dr. A. M. Jackson, Frankfort, President; Dr. W. S. Snyder, Vice-President; and Dr. C. E. Youmans, Frankfort, Secretary-Treasurer.

Dr. Frank Ritter, Louisville, has moved into new offices in the Brown Building, with practice limited to general surgery.

Dr. Frank Pirkey, Louisville, has moved into new offices in the Francis Building, with practice limited to ophthalmology.

DEATHS

Dr. Zachariah A. Thompson, Shelbiana, aged 74, died November 10.

Dr. Grover Latham Howard, Prestonburg, aged 48, died November 27 of cerebral hemorrhage.

Dr. James William Lewis, Bowling Green, aged 59, died September 16.

Dr. Marion Warren, Science Hill, aged 57, died November 9 of injuries received in an automobile accident.

LOUISIANA

The East Baton Rouge Parish Medical Society has elected the following officers for the coming year: Dr. W. H. Pipes, Baton Rouge, President; Dr. Thomas L. Mills, Zachary, Vice-President; and Dr. Lionel F. Lorio, Baton Rouge, Secretary-Treasurer.

The East and West Feliciana Bi-Parish Medical Society has elected the following officers for the coming year: Dr. E. M. Robards, Jackson, President; Dr. C. C. Blakeney, St. Francisville, Vice-President; and Dr. E. M. Toler, Clinton, Secretary-Treasurer.

The seventh Stanford E. Chaille Memorial Oration before the Orleans Parish Medical Society, New Orleans, was delivered on December 19 by Dr. Joseph C. Bloodgood. While in New Orleans Dr. Bloodgood gave two clinico-pathologic demonstrations before physicians and dentists; also a demonstration of tumor cases for physicians and another for roentgenologists.

Dr. L. J. Menville, New Orleans, was recently presented with a gold medal by the Radiological Society of North America for excellent achievements during the past year.

DEATHS

Dr. Patrick Joseph Stricker, Bordelonville, aged 83, died September 20.

Dr. Eugene Bourgeois, Brusly, aged 66, died November 17 of hemorrhage of the stomach.

Dr. Henry Daspit, New Orleans, aged 48, died December 19 of pneumonia.

Dr. George C. Antony, Alexandria, aged 41, died December 12.

Dr. Elliott Kiblinger, New Orleans, aged 59, died November 30.

MARYLAND

Dr. Joseph C. Bloodgood, Baltimore, Clinical Professor of Surgery, Johns Hopkins Medical School, delivered the seventh Stanford E. Chaille Memorial Oration before the Orleans Parish Medical Society, New Orleans, Louisiana, on December 19. On December 20 Dr. Bloodgood gave two clinico-pathologic demonstrations before physicians and dentists, and on the next day gave a demonstration of tumor cases for physicians, and another one for roentgenologists.

The Division of Medical Extension of the University of Maryland recently inaugurated a series of clinics to be conducted on Thursday afternoons. Dr. Lewellys F. Barker, Baltimore, held a medical clinic in this series; Dr. Hugh A. Trout, Roanoke, Virginia, held a surgical clinic; and Dr. George A. Harrop, Jr., Baltimore, held a clinic on myxedema.

Miss P. H. Braithwaite, Baltimore, has been made Superintendent of the Chicago Lying-in Hospital and Dispensary.

Dr. Houston Spencer Everett, Baltimore, and Miss Excie Clay Robertson were married October 1.

DEATHS

Dr. Thomas C. Bussey, Texas, aged 75, died November 21 in a Baltimore hospital of senile gangrene.

Dr. John Camp Butler, Baltimore, aged 71, died suddenly December 2 of heart disease.

Dr. Benjamin Robert Benson, Sr., Cockeysville, aged 78, died December 2 of heart disease.

Dr. John Sherman Fowler, Baltimore, aged 26, died December 3 of paratyphoid fever.

Continued on page 24

WHEN THE PATIENT NEEDS "A" and "D"
REMEMBER THE OLD RELIABLE IS STILL PATCH'S FLAVORED COD LIVER OIL

Typical of recent research on these vitamins is the statement of Drs. Prather, Nelson and Bliss* that "The average physician is better acquainted with the antirachitic vitamin and is likely to disregard the importance of fat-soluble vitamin A and its influence on the child's resistance to infections".

* * *

Throughout the confusion which has existed in the realm of vitamins during the past few years, Patch's Flavored Cod Liver Oil still stands as a reliable source of both vitamins A and D. Physicians are coming to depend on it not only in the prophylaxis and treatment of rickets and allied disorders, but as a valuable aid in building the child's resistance to infection.

* * *

The valuable effects obtained by adult patients who take Cod Liver Oil to build up Winter resistance are no doubt traceable to the combined effects of its two fat-soluble vitamins as well as the energy value derived from its continued use.

* * *

When you prescribe Patch's Flavored Cod Liver Oil, remember that it is guaranteed to contain more than 1000 vitamin A units and more than 150 vitamin D units per gram. The pleasant taste solves the problem of administration. A trial bottle is yours if you will fill in and mail us the coupon.

* * *

Guaranty of Potency

1000 A Units per gram of oil
150 D Units per gram of oil

PATCH'S

ACCEPTED
AMERICAN MEDICAL ASSN.
Council on Pharmacy and Chemistry

The E. L. Patch Company
BOSTON, MASS.

*Prather, E.O.,Jr.; Nelson, Martha; Bliss, A.Richard, Jr.; Am. Jr. Dis. Children, 42-52, July, 1931.

The E. L. Patch Co.,
Stoneham 80, Dept. SM2,
Boston, Mass.

Gentlemen: Please send me a sample of Patch's Flavored Cod Liver Oil and literature.

Dr. .....

Address .....

.....

Continued from page 210

Dr. Richard Lee Linthicum, Church Creek, aged 68, died suddenly October 18 of heart disease.

MISSISSIPPI

The Issaquena-Sharkey-Warren Counties Medical Society has elected the following officers for the coming year: Dr. Preston S. Herring, Vicksburg, President; Dr. T. W. Huey, Grace, Issaquena County, Dr. M. J. Few, Rolling Fork, Sharkey County, Dr. W. E. Johnston, Vicksburg, Warren County, Vice-Presidents; and Dr. L. S. Lippincott, Vicksburg, reelected Secretary-Treasurer.

The Jackson County Medical Society has elected the following officers for the coming year: Dr. F. C. Schmidt, Ocean Springs, President; Dr. J. F. Busey, Pascagoula, Vice-President; and Dr. J. N. Rape, Moss Point, reelected Secretary-Treasurer.

The South Mississippi Medical Society has elected the following officers for the coming year: Dr. R. H. Cranford, Laurel, President; Dr. J. G. Gardner, Columbia, First Vice-President; Dr. C. E. Godman, Poplarville, Second Vice-President; and Dr. J. P. Culpepper, Jr., Hattiesburg, reelected Secretary-Treasurer.

The Tri-County Medical Society of Copiah, Lincoln, Walthall and Lawrence Counties has elected the following officers for the coming year: Dr. J. W. Wilson, Monticello, Lawrence County, President; Dr. J. H. Beavers, Copiah County, Dr. R. S. Savage, Lincoln County, Dr. B. L. Crawford, Walthall County, Dr. B. S. Waller, Lawrence County, Vice-Presidents; and Dr. H. R. Fairfax, Brookhaven, reelected Secretary-Treasurer.

The Winona District Medical Society met in Grenada recently and elected the following officers for the coming year: Dr. Samuel S. Caruthers, Duck Hill, President; and Dr. Edwin Holmes, Winona, reelected Secretary and Treasurer.

The Vicksburg Sanitarium has elected the following officers for 1933: Dr. L. J. Clark, President; Dr. W. E. Johnston, Vice-President; and Dr. L. S. Lippincott, reelected Secretary; all of Vicksburg.

Dr. J. B. Mooney, Scooba, has moved into new offices in the old Bank of Kemper Building.

Dr. C. W. Norwood and Dr. C. F. Gilbert, Corinth, recently entertained Corinth physicians at a supper.

Dr. M. L. Flynt, Newton, is now associated with Dr. F. G. Riley's Hospital at Meridian.

Dr. L. W. Long, Jackson, has been doing postgraduate work at Vanderbilt University.

Miss Ethel B. March, Natchez, is the newly elected President of the Mississippi Nurses' Association.

Dr. Temple Ainsworth, Jackson, and Miss Louise Ogden were married in December.

Dr. Henry Grady Cook, Hattiesburg, and Miss Charlotte C. Lewis were married recently.

DEATHS

Dr. James D. Weeks, Ackerman, aged 73, died November 24 of heart disease.

Dr. James H. Williams, Jackson, aged 64, died October 11.

MISSOURI

Dr. M. Pinson Neal, Columbia, Professor of Pathology, University of Missouri School of Medicine, has been appointed a member of the Council of the Southern Medical Association from Missouri to fill the unexpired term of Dr. Walter Baumgarten, of St. Louis, resigned, the appointment having been announced recently by the President, Dr. Irvin Abell, Louisville, Kentucky.

The Buchanan County Medical Society has elected the following officers for the coming year: Dr. W. H. Minton, President; Dr. G. T. Bloomer, Vice-President; Dr. Emmett F. Cook, Secretary; and Dr. John M. Bell, Treasurer; all of St. Joseph.

The Jasper County Medical Society has elected the following officers for the coming year: Dr. M. O. Coombs, President; Dr. Ed. D. James, Vice-President; Dr. Paul W. Walker, Secretary; and Dr. H. D. McGaughey, Treasurer; all of Joplin.

The Kansas City Southwest Clinical Society has elected the following officers for the coming year: Dr. Peter T. Bohan, President; Dr. Michael J. Owens, Vice-President; and Dr. Herbert S. Valentine, Treasurer; all of Kansas City.

The following officers of the staff of St. Luke's Hospital, Kansas City, were recently elected: Dr. Virgil W. McCarty, President; Dr. Francis E. Wilhelm, Vice-President; and Dr. Ralph Wilson, Secretary and Treasurer; all of Kansas City.

Dr. E. M. Frommer, St. Joseph, has been awarded the Schoen-

Continued on page 28

GILLILAND

Tetanus Antitoxin

(Ultra-Concentrated)

Small-Pox Vaccine **Diphtheria Toxoid**

Typhoid Vaccine **Toxin-Antitoxin**

ACCEPTED AMERICAN MEDICAL ASSN.

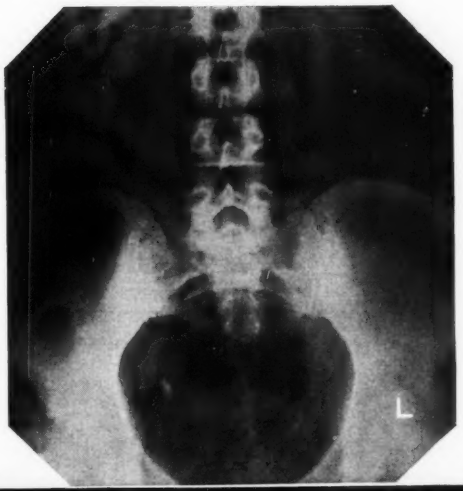
Scarlet Fever Antitoxin

(Prophylactic and Therapeutic Pkgs.)

Complete list of products sent on request

THE GILLILAND LABORATORIES, Inc.

Marietta, Pa.



LEFT—*Radiograph showing a calculus in the urinary tract.*

BELOW—*Radiograph of the urinary tract after an opaque catheter was inserted in the right ureter for the purpose of localization.*

It simulates appendicitis *but* —

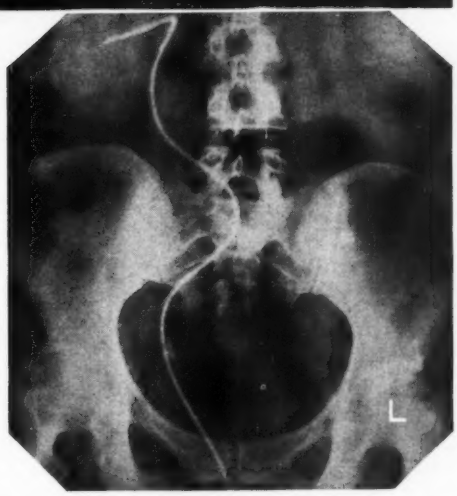
. . . it can present sharp sensations in the lower right quadrant—produce reflex pains in the side—give many of the indications characteristic of appendicitis.

When radiographed, it must admit its identity—ureteral calculus.

Cases with such symptoms require a correct diagnosis before treatment is commenced. Otherwise, failure and grave consequences may result. The differential diagnosis should be based on the radiographic findings. Only when such facts are correlated with the clinical data can the cause of the complaint be determined.

In urography the necessity for soft tissue delineation demands unusual qualities in the film. It must be sensitive, have wide latitude, and be absolutely uniform. By using Eastman X-ray Films, the radiologist is assured these features as inherent characteristics of his recording medium.

● *"Radiography and Clinical Photography," a regular bimonthly periodical, will be sent to you free if you mail the coupon at the right.*



EASTMAN KODAK CO., *Medical Division*, 347 State Street, Rochester, N. Y.

Gentlemen: Please send me a copy of your free publication, "Radiography and Clinical Photography."

Name.....

No. & St.....

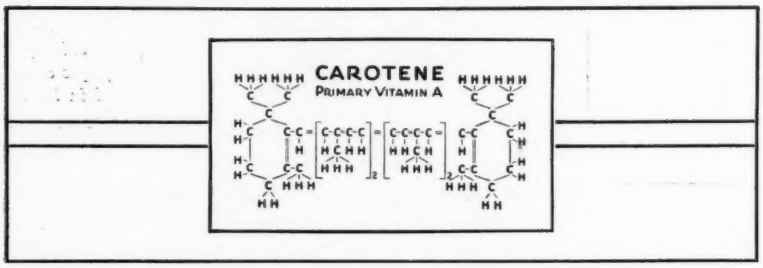
City & State.....

Now..you can prescribe BOTH forms of vitamin A:

SMACO

—the primary form, carotene, of vegetable origin

—the secondary form, as present in fish liver oils



CAROTENE

Carotene (primary vitamin A) is the essential food factor provided by nature to meet certain important bodily requirements and is necessary for the synthesis of secondary vitamin A by the liver. Carotene is to vitamin A therapy what sunlight is to vitamin D therapy.

Cod liver oil, halibut liver oil and other fish liver oils do *not* contain carotene (primary vitamin A) and the secondary form which they do contain, cannot be converted into primary vitamin A. Carotene should be prescribed either alone or with other vitamin products.

..to make sure your patients get **PRIMARY vitamin A,** *prescribe* **Smaco Caritol** *{Carotene in vegetable oil} Product No. 505*

ALONE or with any of these products:

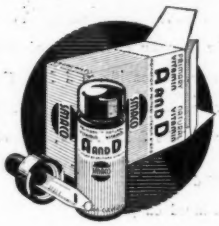
- Plain or flavored cod liver oil
- Cod liver oil with viosterol 10-D
- Viosterol 250-D
- Halibut liver oil, plain, or with viosterol
- Sunshine or ultra-violet light therapy
- Cod liver oil concentrates or tablets
- Smaco Concentrated Vitamin D

a 0.3% solution of carotene in vegetable oil . . absolutely no fishy taste . . deep red color . . 15 c. c. and 50 c. c. protectively colored bottles . . small five to ten drop dosages . high potency . use alone or with other forms of vitamin therapy.

for the greatest **ECONOMY,** *prescribe* **Smaco Cod Liver Oil** *fortified with carotene and natural vitamin D, Product No. 510*

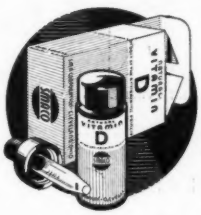
High grade cod liver oil fortified with carotene (primary vitamin A) . . . therefore contains *both* primary and secondary vitamin A . . . also fortified with Columbia-Zucker natural vitamin D . . . *three* times as potent in both A and D, *one* teaspoon equivalent to three teaspoons of standard potent cod liver oil . . . improved flavor, more palatable . . . smaller doses . . . minimum cost to the patient.

for patients who object to taste or bulk of cod liver oil, prescribe **Smaco Vitamins A and D,** *Product No. 525*



Highly potent combination of primary vitamin A (carotene) and Columbia-Zucker *natural* vitamin D . . . absolutely free from fishy taste . . . *ten drops* may be substituted for *three teaspoons* of standard potent cod liver oil.

for vitamin D alone {for the prevention or cure of rickets}, prescribe **Smaco Concentrated Vitamin D,** *Product No. 515*



Highly potent, *natural* vitamin D prepared by methods (Zucker process) developed at Columbia University . . . *not* a cod liver oil concentrate, *not* an irradiated product, but rather a highly potent extract of the antirachitic principle of cod liver oil . . . *ten drops* equivalent in D potency to *three teaspoons* of standard potent cod liver oil.

S. M. A. CORPORATION, *4614 Prospect Ave., Cleveland, Ohio*

Please send samples and literature: 12-23

☐ Smaco Caritol (Primary Vitamin A) ☐ Smaco Vitamins A and D
☐ Smaco Cod Liver Oil—fortified with A&D ☐ Smaco Concentrated Vitamin D

Name .....

Address .....

OR ATTACH TO PRESCRIPTION BLANK OR LETTERHEAD

Continued fom page 24

lein prize medal for 1932 for outstanding research work in cancer by the Hungarian Society of Pathology.

Dr. Harvey Jennett, Kansas City, has succeeded Dr. Porter E. Williams, deceased, as Superintendent of the Kansas City General Hospital.

Dr. Jabez N. Jackson, Kansas City, has succeeded Dr. Calvin L. Cooper, deceased, as Director of Health of Kansas City.

Dr. Frank Hurwitt, Kansas City, is the newly elected President of the Mid-Western Society of Anesthetists.

The University of Missouri Hospital, Columbia, has opened a free tuberculosis clinic, to be held Thursday of each week.

Dr. H. Unterberg, Dr. W. J. Doyle and Dr. E. F. Sassis, St. Louis, presented a clinic on Pathological Movements at the recent annual meeting of the St. Louis Neuropsychiatric Society.

Dr. John Zahorsky, St. Louis, has succeeded Mrs. J. Herndon Smith as President of the Bethesda Hospital of St. Louis.

Dr. Eugene A. Scharff, St. Louis, has resigned as Superintendent of the St. Louis County Hospital.

Dr. M. A. Bliss and Dr. H. I. Spector, St. Louis, made addresses before the annual meeting of the Tuberculosis and Health Society of St. Louis at its recent meeting.

Dr. Kerwin W. Kinard, Kansas City, and Miss Gail Stephens were married recently.

DEATHS

Dr. Charles Leonard Dodson, Moberly, aged 54, died August 27, 1932.

Dr. Porter E. Williams, Kansas City, aged 66, died November 18 of arteriosclerosis and coronary thrombosis.

Dr. John Paul Nemours, St. Louis, aged 71, died November 15 of chronic myocarditis.

Dr. Edward F. Randall, St. Louis, aged 63, died November 2 of heart disease.

Dr. Grandison A. Goben, Kirksville, aged 88, died November 7.

Dr. Samuel Frederick Swantees, St. Louis, aged 66, died August 28 of cerebral hemorrhage as the result of an automobile accident.

Dr. William H. Schutz, Kansas City, aged 61, died October 29.

Dr. Willis Greene Jones, Sedalia, aged 59, died November 4 of cerebral hemorrhage.

Dr. Herbert Joseph Strub, St. Louis, aged 39, died December 2 of heart disease.

Dr. Calvin LaFayette Cooper, Kansas City, aged 61, died December 1 of heart disease.

Dr. Ned McGuire Fuller, Desloge, aged 47, died November 19 of bronchopneumonia.

Dr. C. Frederick Pfingsten, St. Louis, aged 57, died November 20 of heart disease.

Dr. Marquis DeLafayette Isley, Excelsior Springs, aged 68, died November 19.

NORTH CAROLINA

The Pitt County Medical Society has elected the following officers for the coming year: Dr. J. E. Nobles, Greenville, President; Dr. Paul Fitzgerald, Vice-President; and Dr. W. M. B. Brown, Greenville, Secretary-Treasurer.

The Robeson County Medical Society has elected the following officers for the coming year: Dr. L. E. Ricks, Fairmont, President; Dr. J. McN. Smith, Rowland, President-Elect; Dr. J. N. Britt, Lumberton, Vice-President; and Dr. A. B. Holmes, Fairmont, Secretary-Treasurer.

The Wake County Medical Society has elected the following officers for the coming year: Dr. C. C. Carpenter, Wake Forest, President; Dr. Charles P. Eldridge, Raleigh, Vice-President; and Dr. V. S. Caviness, Raleigh, Secretary.

Dr. Ernest W. Franklin, Jr., Burlington, is the newly appointed Chief Resident Physician in the obstetrical service of the Kings County Hospital, Brooklyn.

Dr. J. G. Pittman, Gaffney, has opened an office in Blacksburg, where he will practice as well as in Gaffney.

Dr. G. T. Mitchell has moved from Jennings to Wilkesboro, where he is practicing.

Addie M. Perry is the new Superintendent of the Asheville Mission Hospital at Asheville.

Dr. Robert H. Wright, Jr., Greenville, and Miss Carolyn McLean were married in December.

Dr. Earl Runyan Tyler and Miss Beryl Jones, both of Durham, were married recently.

Dr. Frank M. Killian and Miss Sallie Taylor, both of Franklin, were married in December.

Dr. Norman Oliver Benson and Miss Lily Snead Varser, both of Lumberton, were married recently.

Continued on page 30

TRADE PYRIDIUM MARK

PHENYLAZO-ALPHA-ALPHA-DIAMINO-PYRIDINE MONO-HYDROCHLORIDE (MANUFACTURED BY THE PYRIDIUM CORPORATION)

FOR URINARY INFECTIONS

In the treatment of diseases of the genito-urinary tract where urinary antisepsis is important, physicians are showing a marked preference for Pyridium because of its chemical stability, penetrating action, and antibacterial properties. Literature describing the clinical use of Pyridium will be promptly furnished on request.

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MANUFACTURING CHEMISTS · RAHWAY, NEW JERSEY

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"CURRENT COMMENT"
FROM THE A. M. A.—DECEMBER 17, 1932

They say!

". . . the United States Public Health Service indicates that some 200,000 persons had pellagra in 1929. The cases occurred mostly in the South in families of LOW INCOME*. . . . The studies indicated that some people can store the pellagra preventing factor better than others, which explains why some people come down with the disease in certain families whereas others do not."*

*THAT MEANS EVERYONE IN 1933

They advise

". . . 1 ounce of pure dried yeast per person daily to the food supply customarily used in winter and early spring is sufficient to reduce greatly the incidence of pellagra among those people who are likely, in times of economic depression, to live largely on monotonous and one-sided diets."

The remedy

In describing their curative results with 26 cases of pellagra in Georgia, when using Brewers' Yeast-Harris, Drs. Goldberger and Tanner (U.S.P.H. Service) advise, in "Public Health Reports, January 1925," ½ oz. to 1 oz. Brewers' Yeast-Harris, daily, mixed with any part of the food, as desired.

BREWERS' YEAST
—POWDER—
Widely used for pellagra, sprue, herpes, anemias and true anorexia.

—FREE SAMPLES TO PHYSICIANS—

The HARRIS LABORATORIES
TUCKAHOE, NEW YORK

TESTED H L STANDARDS

A SAFE FOOD THE YEAR ROUND—

Horlick's Malted Milk

Answers Many Diet Problems:

1. A dependable, easily digested food for infant or growing child.
2. A nourishing food-drink for the nursing mother.
3. A beneficial table beverage in place of tea or coffee.
4. A delicate food for the sick or convalescent. Horlick's prepared with water has been found to definitely stimulate the appetite (Am. Jrl. Dis. Chil. 40:305).
5. A light luncheon, at any time, for the doctor and his family.

HORLICK'S ACCEPTED AMERICAN MEDICAL ASSN. ***Racine, Wis.***

Continued from page 28

DEATHS

Dr. John Gerald Murphy, Wilmington, aged 60, died December 18 of pneumonia.

Dr. Virgil R. Butt, Bakersville, aged 76, died November 5 of carcinoma of the prostate.

Dr. John A. Pollock, Kinston, aged 88, died November 11 of gastritis.

Dr. J. J. Young, Clayton, aged 60, died November 6 in a Raleigh Hospital of acute dilatation of the heart and hypertension.

OKLAHOMA

The Bryan County Medical Society has elected the following officers for, 1933: Dr. W. A. Houser, Durant, President; Dr. H. B. Fuston, Bokochito, Vice-President; and Dr. J. T. Wharton, Durant, Secretary-Treasurer.

The Garvin County Medical Society has elected the following officers for 1933: Dr. Ray H. Lindsey, President; Dr. W. P. Greening, Vice-President; and Dr. John R. Callaway, Secretary-Treasurer; all of Pauls Valley.

The Hughes County Medical Society has elected the following officers for 1933: Dr. W. L. Taylor, Holdenville, President; Dr. H. S. Hamilton, Dustin, Vice-President; and Dr. G. W. Diggs, Wetumka, Secretary.

The LeFlore County Medical Society has elected the following officers for 1933: Dr. G. R. Booth, LeFlore, President; and Dr. W. M. Duff, Spiro, Secretary-Treasurer.

The Lincoln County Medical Society has elected the following officers for 1933: Dr. F. D. Brown, Sparks, President; Dr. John Cassidy, Chandler, Vice-President; and Dr. C. W. Robertson, Chandler, reelected Secretary.

The Muskogee County Medical Society has elected the following officers for 1933: Dr. C. V. Rice, President; Dr. C. E. White, Vice-President; and Dr. Shade D. Neely, Secretary; all of Muskogee.

The Osage County Medical Society has elected the following officers for 1933: Dr. C. H. Guild, Shidler, President; Dr. C. W. Williams, Pawhuska, Vice-President; and Dr. M. E. Rust, Pawhuska, Secretary-Treasurer.

The Pontotoc County Medical Society has elected the follow-

Continued on page 32

NEUTRALIZATION AND ELIMINATION

The neutralization of acids and the dilution and elimination of toxins is recognized as important not only to the recovery but to the comfort of the patient.

The palatability of properly cooled Kalak is so appealing to the patient that the problem of proper alkali and fluid administration to combat an acid intoxication is solved for the physician.

KALAK WATER CO. of NEW YORK, Inc.
6 Church Street, New York City

Kalak
TRADE MARK REG. U.S. PAT. OFF.

SHARPER SURGICAL SCISSORS WITHOUT REGRINDING

CONSTANT regrinding of your scissors eventually destroys them. Why not eliminate it? BARD-PARKER RENEWABLE EDGE SCISSORS require no regrinding. Dulled edges are quickly replaced with new keen edges at 16⅔ cents per pair against a much higher average regrinding cost for other scissors.

Bard-Parker Scissors practically eliminate scissors replacements. Since they are not subject to grinding wear, they last indefinitely saving you many times over the cost of replacing scissors worn out by repeated grindings.

Bard-Parker Scissors facilitate operating technique because the edges are uniformly sharp. This is seldom true of reground scissors.

We believe that Bard-Parker Renewable Edge Scissors will give you greater economy and efficiency. Why not ask your dealer to show you a pair or write for further particulars?

Left: Bard-Parker Renewable Edge Scissors, 5½" Operating, Straight, showing three styles of points.

Above: Renewable edge partly removed from scissors.

BARD-PARKER RENEWABLE EDGE SCISSORS
Stainless Steel
NOW AVAILABLE

5½" Dissecting, Straight, Mayo type
6⅜" Dissecting, Straight, Mayo type
5½" Operating, Straight, S & B
5½" Operating, Straight, S & S
5½" Operating, Straight, B & B

BARD-PARKER COMPANY, INC.
369 LEXINGTON AVENUE, NEW YORK, N. Y.

A BARD-PARKER PRODUCT

DIAL, "Ciba" . . .

AN EXCELLENT HYPNOTIC. . . AN EQUALLY GOOD SEDATIVE

A SINGLE tablet of DIAL, "CIBA" —1½ grains—will usually afford your patient a night of sound, refreshing sleep.

DIAL, "CIBA" calms excited, irritated nerves, and for such occasions as preoperative treatment, post-operative restlessness, nervous insomnia, etc., it will fulfill all your requirements of a good hypnotic.

Best of all, it has no injurious effect on the circulation or respiration, and does not cause any unpleasant after-effect.

For sedation, DIAL, "CIBA" in elixir form or in one-half grain tablets will enable your patient to continue work without drowsiness.

The solution of DIAL, "CIBA" with Urethane — the only proved stable solution of a malonylurea derivative available in ampule form — is used with distinct success in obstetrics.*

DIAL, "CIBA" is chemically known as diallylmalonylurea.

"COUNCIL ACCEPTED"

Tablets - Elixir - Ampules - Powder

*R. G. Nelson, Journal of the Florida Medical Association, August, 1932.

Ciba Company, Inc.

NEW YORK, N. Y.

Continued from page 30

ing officers for 1933: Dr. C. F. Needham, President; Dr. Ernest A. Canada, Vice-President; and Dr. Hervey A. Foerster, Secretary; all of Ada.

The Tulsa County Medical Society has elected the following officers for 1933: Dr. Charles H. Haralson, President; Dr. R. N. Smith, President-Elect; Dr. Victor Allen, Vice-President; and Dr. Carl F. Simpson, reelected Secretary-Treasurer; all of Tulsa.

The Washington County Medical Society has elected the following officers for 1933: Dr. F. S. Etter, Bartlesville, President; Dr. G. W. Crawford, Dewey, Vice-President; Dr. J. V. Athey, Bartlesville, Secretary; and Dr. E. E. Beechwood, Bartlesville, Treasurer.

The Woods-Alfalfa County Medical Society has elected the following officers for 1933: Dr. D. B. Ensor, Hopeton, President; Dr. A. E. McGrew, Beaver, Vice-President; and Dr. O. E. Templin, Alva, Secretary.

Deaths

Dr. James A. U. Carter, Sapulpa, aged 53, died August 20, 1932.

Dr. Cullie J. Green, Durant, aged 71, died October 28 of chronic myocarditis.

Dr. Dell Lee Connell, Picher, aged 61, died November 4 of bronchopneumonia.

Dr. Thomas Clay Sanders, Shawnee, aged 55, died October 16 of heart disease.

Dr. Robert L. Russell, Marlow, aged 63, died October 18.

Dr. J. Frank Dickerson, St. Louis, aged 57, died suddenly November 14 of heart disease.

Dr. G. W. Taylor, El Reno, aged 72, died December 18.

Dr. Frank Lipscomb Watson, McAlester, aged 60, died December 21.

SOUTH CAROLINA

Dr. Frank H. McLeod, Florence, has been reappointed the member of the Council of the Southern Medical Association from South Carolina for a regular Council term of three years, the appointment having been announced recently by the President, Dr. Irvin Abell, Louisville, Kentucky.

The Greenville County Medical Society has elected the following officers for 1933: Dr. R. M. Pollitzer, Greenville, President; Dr. Clay W. Evatt, Greenville, Vice-President; Dr. Jack Parker, Greenville, Secretary; and Dr. J. W. Jervey, Jr., Greenville, Treasurer.

The Newberry County Medical Society has elected the following officers for 1933: Dr. A. T. Neely, Newberry, President; Dr. H. B. Thomas, Whitmire, Vice-President; and Dr. Hugh Senn, Beaufort, Secretary-Treasurer.

Dr. William Weston, Jr., and Miss Henrietta Nelson, both of Columbia, were married in October.

Deaths

Dr. Charles Augustus Crosby, Leeds, aged 63, died December 5 of heart disease.

Dr. William Adolphus Gantt, Jefferson, aged 46, died November 4.

Dr. W. Pliny League, Simpsonville, aged 88, died October 14.

TENNESSEE

The Anderson County Medical Society has elected the following officers for 1933: Dr. V. O. Buttram, Devonia, President; Dr. O. E. Ballou, Clinton, Vice-President; and Dr. J. S. Hall, Clinton, Secretary-Treasurer.

The Bedford County Medical Society has elected the following officers for 1933: Dr. F. C. Hargis, Wartrace, President; Dr. S. S. Moody, Shelbyville, Vice-President; and Dr. W. H. Avery, Shelbyville, Secretary-Treasurer.

The Chester, Henderson and Decatur Counties Medical Society has elected the following officers for 1933: Dr. L. C. Smith, Henderson, President; Dr. L. E. Luna, Parsons, Decatur County, Dr. T. S. Davis, Montezuma, Chester County, Dr. R. L. Wylie, Scotts Hill, Henderson County, Vice-Presidents; and Dr. W. I. Howell, Lexington, Secretary.

The Davidson County Medical Society has elected the following officers for 1933: Dr. L. C. Caldwell, President; Dr. J. M. Lee, Vice-President; and Dr. N. S. Shofner, Secretary-Treasurer; all of Nashville.

The Dyer, Lake and Crockett Counties Medical Society has elected the following officers for 1933: Dr. Percy Conyers, Dyersburg, President; Dr. J. D. Brewer, Dyersburg, First Vice-President; Dr. R. E. Hellen, Ridgely, Second Vice-President; and Dr. J. Paul Baird, Dyersburg, Secretary-Treasurer.

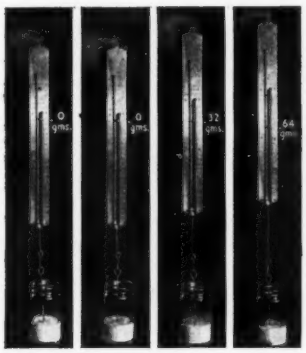
Continued on page 34

CURD TENSION

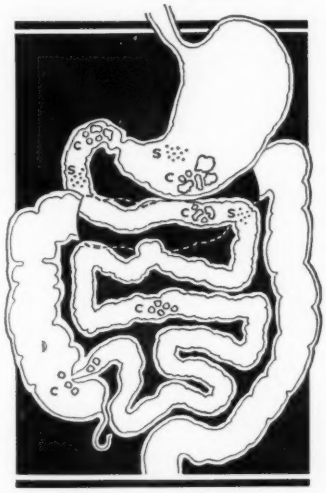
- AND INFANT FEEDING -

ITS · EFFECT · UPON · THE · ASSIMILATION · OF

CARBOHYDRATES



BREAST MILK SIMILAC POWDERED MILK COW'S MILK



C—Cow's milk S—Similac
Schematic drawing of the relative size of the curds of cow's milk and Similac vomited by six weeks old puppies after one-half hour's ingestion.

THE curds of milk contain only a small amount of carbohydrates, sufficient, however, to be a disturbing factor in infant feeding.

"A large part of the digestion and absorption of the carbohydrates takes place in the upper part of the small intestines."[1]

"The disaccharides, maltose, sucrose and lactose, are converted into monosaccharides through the action of enzymes secreted by the small intestine and are absorbed in the form of monosaccharides.

"When absorption is impaired, some sugar may reach the large intestine and here be attacked by the bacteria present. Sugar itself rarely appears in the stool, it being decomposed to form acids and gases."[2]

The large, tough curds of cow's milk are more slowly disintegrated and thus more slowly release the encased carbohydrates than the soft, flocculent curds of SIMILAC.

The disintegration of the curd of cow's milk may not be completed until after the curd, with the encased carbohydrate, has passed that portion of the small intestine where the enzymes for the conversion of disaccharides into monosaccharides are present. There is not this possibility when SIMILAC is fed because the fineness of the curd of SIMILAC does not permit of the encasement of carbohydrates to any extent.

The finer the curd the greater the surface area. The greater the surface area the more exposed are the fats, carbohydrates, proteins and salts to the digestive enzymes. Result . . . a more complete utilization of the food elements.

[1] London & Polowzowa: Zeitschr. f. physiol. Chem. 1906, XLIX, 328.

[2] Marriott: Infant Nutrition, pg. 81.

Samples and literature will be sent on receipt of your prescription blank.

SIMILAC—Made from fresh skim milk (casein modified); with added lactose, salts, milk fat and vegetable and cod liver oils.

M & R
DIETETIC LABORATORIES, INC.,
COLUMBUS, OHIO.

Continued from page 32

The Giles County Medical Society has elected the following officers for 1933: Dr. G. C. Grimes, Aspen Hill, President; Dr. John H. Morris, Pulaski, Vice-President; and Dr. T. F. Booth, Pulaski, Secretary-Treasurer.

The Hamilton County Medical Society has elected the following officers for 1933: Dr. Hiram A. Laws, President; Dr. Franklin B. Bogart, Vice-President; and Dr. William J. Sheridan, Secretary-Treasurer; all of Chattanooga.

The Hardin, Lawrence, Lewis, Perry and Wayne Counties Medical Society has elected the following officers for 1933: Dr. F. H. Norman, Waynesboro, President; and Dr. C. C. Stockard, Lawrenceburg, Secretary-Treasurer.

The Madison County Medical Society has elected the following officers for 1933: Dr. George W. Brasher, Jackson, President; Dr. F. C. James, Gadsden, Vice-President; and Dr. B. C. Arnold, Jackson, Secretary-Treasurer.

The McMinn County Medical Society has elected the following officers for 1933: Dr. W. R. Arrants, Athens, President; Dr. D. P. Brendle, Englewood, Vice-President; and Dr. Roy Epperson, Athens, Secretary-Treasurer.

The Montgomery County Medical Society has elected the following officers for 1933: Dr. R. M. Graham, President; Dr. L. L. Neblett, Vice-President; and Dr. M. L. Shelby, Secretary-Treasurer; all of Clarksville.

The Polk County Medical Society has elected the following officers for 1933: Dr. C. W. Strauss, Copperhill, President; Dr. H. P. Hyde, Copperhill, Vice-President; and Dr. F. O. Geisler, Isabella, Secretary-Treasurer.

The Roane County Medical Society has elected the following officers for 1933: Dr. J. J. Waller, Oliver Springs, President; Dr. John Roberts, Kingston, Vice-President; and Dr. W. W. Hill, Harriman, Secretary-Treasurer.

The Sevier County Medical Society has elected the following officers for 1933: Dr. O. H. Yarberry, President; Dr. R. J. Ingle, Vice-President; and Dr. C. P. Wilson, Secretary-Treasurer; all of Sevierville.

The Shelby County Medical Society has elected the following officers for 1933: Dr. Max Goltman, President; Dr. P. H. Wood, Vice-President; Dr. W. L. Williamson, President-Elect; Dr. J. J. Hobson, Treasurer; and Dr. A. F. Cooper, Secretary; all of Memphis.

The Smith County Medical Society has elected the following officers for 1933: Dr. R. E. Garrett, Dixon Springs, President; Dr. J. J. Beasley, Pleasant Shade, Vice-President; and Dr. T. S. Wilson, Gordonsville, Secretary-Treasurer.

The Stone's River and Rutherford County Medical Society has elected the following officers for 1933: Dr. M. B. McCrary, Woodbury, President; Dr. W. T. Robison, Murfreesboro, Vice-President; and Dr. J. A. Scott, Murfreesboro, Secretary-Treasurer.

The Washington County Medical Society has elected the following officers for 1933: Dr. Wallace L. Poole, President; Dr. Harry D. Miller, Vice-President; and Dr. Carroll H. Long, Secretary-Treasurer; all of Johnson City.

The Weakley County Medical Society has elected the following officers for 1933: Dr. J. E. Taylor, Dresden, President; Dr. M. O. Ingram, Dresden, Vice-President; and Dr. E. J. Huey, Martin, Secretary-Treasurer.

The Williamson County Medical Society has elected the following officers for 1933: Dr. H. C. Stewart, President; and Dr. K. S. Howlett, Sr., Secretary-Treasurer; both of Franklin.

The Wilson County Medical Society has elected the following officers for 1933: Dr. J. L. Ames, President; Dr. S. B. McFarland, Vice-President; and Dr. J. R. Bone, Secretary-Treasurer; all of Lebanon.

Dr. Miller Robinson, formerly of Birmingham, Alabama, has located in Nashville with offices in the Medical Arts Building.

Dr. Morris Atkins has located in Dresden, after completing his internship in Memphis.

Dr. Paul W. Wilson has located in Dresden, since completing his internship in the Memphis City Hospital.

Dr. Madison Buckley, formerly of San Augustine, Texas, has opened offices in Martin.

Dr. R. A. McCall has opened offices in Sevierville.

Dr. R. P. Trotter, formerly of Sparta, has opened offices in McMinnville.

Dr. Joe T. Smith, Knoxville, has moved into new offices in the Medical Arts Building.

Dr. Sam B. McFarland, Lebanon, has opened offices in the Doctors' Building, and has also opened the McFarland Hospital.

Dr. Daniel Jay Johns, Jr., and Miss Elizabeth Holt, both of Nashville, were married recently.

Dr. J. McChesney Hogshead, Chattanooga, and Miss Gladys Sarah Lee Coombs were married in October.

Continued on page 36

ORGANOTHERAPY

can be effective only through the use of dependable endocrine products. The reputation and integrity of the manufacturer is the physician's only guarantee of reliability of those organotherapeutic products for which there is no chemical or biological assay. Every manufacturing process of all our products is supervised by our Analytical and Research Department.

DESICCATED PITUITARY BODY, U.S.P.	**EPINEPHRIN**
CORPUS LUTEUM	**EPINEPHRIN AMPULES**
CORPUS LUTEUM AMPULES	**SOLUTION OF EPINEPHRIN (1-1000)**
PANCREATIN, U.S.P.	**DRIED SUPRARENALS, U.S.P.**
SOLUTION OF POST-PITUITARY	**DRIED THYROIDS, U.S.P.**

Insure potency and constancy of action by prescribing the products of

G. W. CARNRICK CO.

Manufacturers of **Organotherapeutic Products**

2-24 Mt. Pleasant Avenue, Newark, New Jersey

Prevent Rickets Through Irradiated Dryco

THE DAILY RATION OF IRRADIATED DRYCO PROTECTS ANY BABY AGAINST RICKETS!

"The great advantage of using activated milk, both fluid and dry, in the prophylaxis of rickets is that this measure furnishes an automatic method of therapy and likewise provides calcium and phosphorus."

Hess, A. F., and Lewis, J. M.
Jour. A. M. A., Vol. 99, No. 8, Aug. 20, 1932.

"It may be added that dry milk, milk dried by the roller process, was found last year to be very effective in protecting against or curing rickets, and that this product maintains its potency for a period of many months." (Ibid.)

DRYCO is the Only Irradiated Dry Milk Product

The same Dryco which has been successfully prescribed over a period of 16 years *plus an increased vitamin D factor.*

PRESCRIBE

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DRYCO

Made from superior quality milk from which part of the butterfat has been removed, irradiated by the ultraviolet ray, under license by the Wisconsin Alumni Research Foundation, (U. S. Patent No. 1,680,818) and then dried by the "Just" Roller Process.

ALL DRYCO IN THE HANDS OF DRUGGISTS IS IRRADIATED

The Dry Milk Co., Inc.
Dept. S. M.
205 East 42nd Street
New York, N. Y.

COUPON

THE DRY MILK CO., INC., Dept. SM,
205 East 42nd St., New York, N. Y.

Please send special literature: Dryco, The Irradiated Milk; Irradiated Milk in the Treatment of Rickets; Milk Irradiated by the Carbon Arc Lamp (Abstract); Irradiated Milk—The New Rickets Prevention Therapy.

Continued from page 34

DEATHS

Dr. Percy W. Toombs, Memphis, aged 53, died January 3.
Dr. Robert Lee Peyton, Johnson City, aged 55, died October 19 of cerebral hemorrhage.
Dr. J. Leonard Aymett, Pulaski, aged 47, died November 2 of tuberculosis.
Dr. J. L. McGowan, Knoxville, aged 66, died August 22, 1932.
Dr. Charles Meigs Dulaney, Blountville, died October 3.
Dr. Yandell Young Miller, Dukedom, aged 58, died November 16 of cholecystitis.
Dr. Stephen Nicholas Howser, Clarksville, aged 70, died October 29.
Dr. Joseph Stone Lyon, Knoxville, aged 51, died November 29 of heart disease.
Dr. Tower L. Smith, Rockwood, aged 56, died December 21 in an automobile wreck.
Dr. Margaret O. Davis, Nashville, aged 60, died December 28.
Dr. W. H. Harrison, Loudon, aged 78, died December 22.

The "MESCO" Laboratories manufacture the largest line of Ointments in the world. Sixty different kinds. We are originators of the Professional Package. Specify "MESCO" when prescribing ointments. Send for lists.

Manhattan Eye Salve Co.

LOUISVILLE, KENTUCKY

Classified Advertisements

WANTED—Middle aged physician to locate in inland town in Alabama, physician now in community having to give up his practice due to failing health. Opportunity to make a living from the start, and chance to build up practice. For particulars write M. C. G., care JOURNAL.

PHYSICIAN WANTED—Death of physician leaves large country territory without a physician. Good opening for physician interested in a country practice. Address W.B.T., care JOURNAL.

WANTED—Experienced x-ray technician desires position. Knowledge of treatment work, physio-therapy, electrocardiographs, and office work. Best references furnished. State salary paid. Address K.V.M., care JOURNAL.

HOME FOR CONVALESCENTS—In Blue Grass section; guests received in well appointed home. Tired business executives, lonely shut-ins, slow convalescents and frail elderly persons receive personal care. Moderately priced. Endorsed by Franklin County Medical Association. Mrs. C. Montgomery, 507 West 2nd Street, Frankfort, Kentucky. Telephone 366.

ASSISTANCE OFFERED TO MEDICAL WRITERS. Research. Abstracts. Translations (all languages). Papers prepared from author's data. Ten years' experience with leading physicians and appointments on medical journals of highest standing. I employ no assistants; all my work is done personally and is reliable. Florence Annan Carpenter, 413 St. James Place, Chicago, Ill.

DRUG AND ALCOHOL PATIENTS are humanely and successfully treated in Glenwood Park Sanitarium, Greensboro, N. C; reprints of articles mailed upon request. Address W. C. Ashworth, M.D., Owner, Greensboro, N. C.

TEXAS

Dr. Elbert Dunlap, Dallas, has been reappointed the member of the Council of the Southern Medical Association from Texas for a regular Council term of three years, the appointment having been announced recently by the President, Dr. Irvin Abell, Louisville, Kentucky.

The Kaufman County Medical Society has elected the following officers for 1933: Dr. D. L. Sprinkle, Mabank, President; Dr. K. W. Rowe, Terrell, Vice-President; and Dr. D. H. Hudgins, Forney, Secretary-Treasurer.

The Palo Pinto County Medical Society has elected the following officers for 1933: Dr. J. H. McCorkle, Gordon, President; Dr. J. N. Mincey, Mineral Wells, Vice-President; and Dr. J. C. Montgomery, Mineral Wells, Secretary-Treasurer.

The Tarrant County Medical Society has elected the following officers for 1933: Dr. Frank C. Beall, President; Dr. W. G. Phillips, Vice-President; and Dr. Craig Munter, Secretary-Treasurer; all of Fort Worth.

The Van Zandt County Medical Society has elected the following officers for 1933: Dr. Horace H. Hilliard, Canton, President; Dr. Felix V. Bryant, Martins Mills, Vice-President; and Dr. Horace A. Baker, Wills Point, Secretary-Treasurer.

Dr. William C. Coleman has moved from Palestine to Vernon.
Dr. M. E. Corbin has moved from Mentone to Crane.
Dr. T. H. Harrell has moved from McAllen to Mission.
W. C. Lynch, El Paso, formerly a member of the Board of Trustees of the El Paso Masonic Hospital, has become Superintendent of the Hospital.

DEATHS

Dr. Thomas P. McLendon, Corsicana, aged 44, died November 27.
Dr. William Todd Largent, McKinney, aged 57, died October 23 of heart disease.
Dr. Richard W. Hix, Vernon, aged 73, died October 14 of carcinoma of the liver.
Dr. Jonathan Davis Moore, Marlin, aged 82, died November 5 of diabetes mellitus.
Dr. Alanson G. Pearce, Orange, aged 65, died July 10, 1932, of angina pectoris.
Dr. A. C. DeLong, San Angelo, aged 74, died suddenly October 30.

VIRGINIA

Dr. R. Finley Gayle, Jr., Richmond, has been appointed a member of the Council of the Southern Medical Association from Virginia for a regular Council term of three years, the appointment having been announced recently by the President, Dr. Irvin Abell, Louisville, Kentucky. Dr. Gayle succeeds Dr. A. L. Gray, of Richmond, deceased.

The Richmond Academy of Medicine has elected the following officers for the coming year: Dr. Carrington Williams, President; Dr. Turner S. Shelton, First Vice-President; Dr. J. Powell Williams, Second Vice-President; Dr. T. D. Jones, Secretary-Treasurer; Dr. Karl S. Blackwell, Chairman of Program Committee, Dr. Joseph Geisinger, Chairman of Board of Censors, and Dr. Windham D. Blanton, Chairman of Board of Trustees; all of Richmond.

The Richmond Ophthalmological and Otolaryngological Society has elected the following officers for the coming year: Dr. R. W. Vaughan, President; Dr. George H. Snead, Vice-President; and Dr. W. R. Weisinger, Secretary-Treasurer; all of Richmond.

The Lynchburg Academy of Medicine has elected the following officers for 1933: Dr. Sam Wilson, President; Dr. R. D. Caldwell, Vice-President; and Dr. John Hundley, Jr., Secretary-Treasurer; all of Lynchburg.

The Seaboard Medical Association of Virginia and North Carolina has elected the following officers for 1933: Dr. Walter B. Martin, Norfolk, Virginia, President; Dr. W. Bernard Kinlaw, Rocky Mount, North Carolina, Dr. Oscar R. Yates, Suffolk, Virginia, Dr. John C. Tayloe, Washington, North Carolina, Dr. Robert Matthews, Norfolk, Virginia, Vice-Presidents; Dr. A. M. Burfoot, Fentress, Virginia, reelected Treasurer; and Dr. Clarence Porter Jones, Newport News, reelected Secretary.

Dr. Bob Lewis Field has opened offices in Norfolk, after completing his internship at Norfolk Protestant Hospital.

Dr. J. Arthur Gallant, Richmond, has moved his office and residence to 201 North Boulevard.

Dr. Francis Randolph Crawford has located in Farmville, where he will be associated with the Southside Community Hospital.

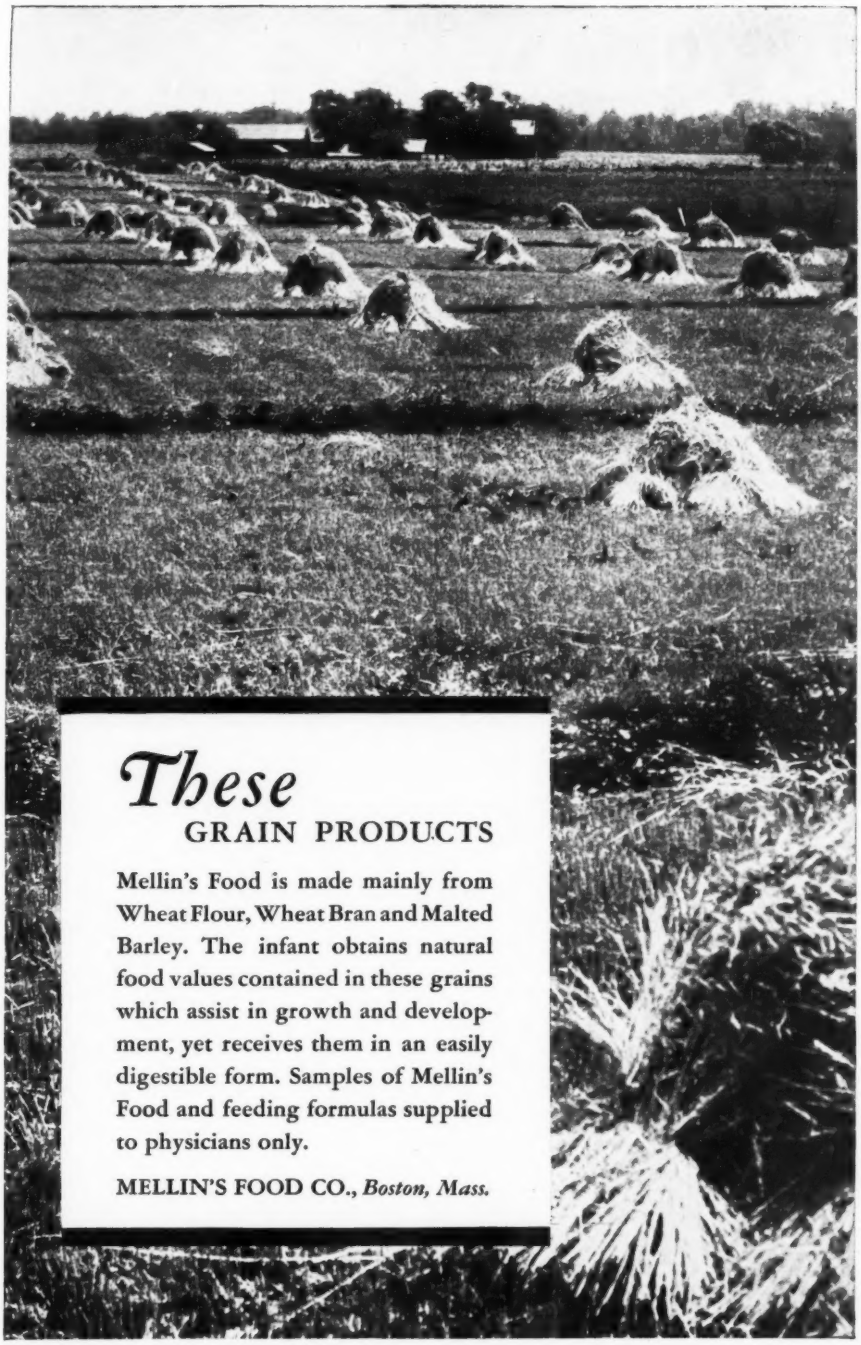
Dr. Clifton R. Titus, formerly located at Lucketts, is now practicing at Bassetts.

Dr. M. Cohen has located in Richmond for general practice.

Dr. Richard B. Nicholls has become associated with Dr. G. Bentley Byrd, Richmond, where he will do obstetrics and gynecology.

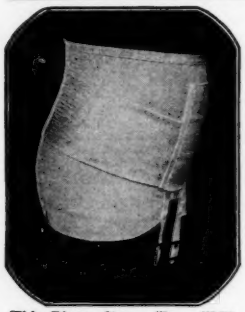
Dr. E. L. McGill, Petersburg, is the newly appointed City

Continued on page 38


These
GRAIN PRODUCTS
Mellin's Food is made mainly from Wheat Flour, Wheat Bran and Malted Barley. The infant obtains natural food values contained in these grains which assist in growth and development, yet receives them in an easily digestible form. Samples of Mellin's Food and feeding formulas supplied to physicians only.
MELLIN'S FOOD CO., Boston, Mass.

Trademark Registered **STORM** Trademark Registered

Binder and Abdominal Supporter



Gives perfect uplift and is worn with comfort. Made of Cotton, Linen or Silk, washable as underwear.

Three distinct types of Storm Supporters — many variations of each type.

This Photo Shows Type "N"

STORM Supporters are made for all conditions needing abdominal uplift. Ptosis, Hernia, Pregnancy, Obesity, Relaxed Sacro-Iliac, Articulations, Kidney Conditions, Post-Operative Support, etc.

Each Belt Made to Order **Ask for Literature**

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PURITAN MAID TRADE MARK REG.

NITROUS OXID
OXYGEN
ETHYLENE
CARBON DIOXID
CARBON DIOXID AND OXYGEN MIXTURES

TIME TELLS!

In the last twenty years in America every so often some new form of anesthetic has been put on the market, sometimes with most startling claims. Most of them vanish as rapidly as they come, because they cannot stand the test of time.

It was just about twenty years ago that NITROUS OXID AND OXYGEN first came into real use as a major anesthetic. Today, supplemented by ETHYLENE and CARBON DIOXID gases, they are more largely consumed than ever before, and the consumption is constantly growing. THE USE OF THESE PRODUCTS HAS STOOD THE TEST OF TIME.

Back of the Puritan Maid Label on each and every cylinder identifying the products of the Puritan Compressed Gas Corporation is the reputation of eighteen years in the field. For safety reasons we differentiate our gases with distinctive colors over the entire cylinder, as recommended by the resolution of the International Anesthesia Research Society.

Ever read the lines, "Compiled from sources we believe to be correct but which we do not guarantee"?—WE ABSOLUTELY guarantee our products!

Write for your copy of our latest Booklet, "The Real Story of Oxygen for the Medical Profession". Also catalogues of Latest Oxygen Tents.

Puritan Compressed Gas Corp.
Sales Offices in Most Principal Cities
General Offices, Kansas City, Mo.

Continued from page 36

Health Officer, during Dr. Mason Romaine's leave of absence.

Dr. Charles B. Martin, formerly of Danville, has located at Nokesville.

Dr. J. Allison Hodges, Richmond, has opened offices at 924 West Franklin Street.

Dr. Charles R. Vance, Norfolk, has moved into new offices at 706 Maury Place.

Dr. Willcox Ruffin has located in Norfolk, after a four-year surgical fellowship at the Mayo Clinic.

Dr. C. S. Stone, Farmville, is taking special work at the University.

Dr. Clyde F. Ross, Richmond, has been made President of the Alumni Chapter of Sigma Chi Fraternity.

Dr. F. A. Sinclair, Newport News, has been elected President of the Tidewater Fox Hunters' Association.

DEATHS

Dr. John Hack Ayres, Accomac, aged 67, died December 8 of cerebral arteriosclerosis.

Dr. Richard H. Holt, Middleburg, aged 34, died January 2.

Dr. George Keesee Vanderslice, Phoebus, aged 62, died December 19.

Dr. Walter Merritt Seward, Triplett, aged 70, died December 20.

Dr. James H. Culpepper, Norfolk, aged 50, died December 25.

Dr. Kirkland Ruffin, Norfolk, aged 67, died December 25.

WEST VIRGINIA

The Barbour-Randolph-Tucker County Medical Society has elected the following officers for 1933: Dr. H. H. Bolton, Pierce, President; Dr. H. K. Owens, Elkins, Dr. C. B. Williams, Philippi, Vice-Presidents; and Dr. Russell S. Wolfe, Elkins, Secretary-Treasurer.

The Eastern Panhandle Medical Society has elected the following officers for 1933: Dr. M. H. Porterfield, Martinsburg, President; Dr. R. E. S. Taylor, Paw Paw, Dr. J. J. Pittman, Charles Town, Vice-Presidents; and Dr. Edwin Cameron, Martinsburg, reelected Secretary-Treasurer.

The Grant-Hampshire-Hardy-Mineral County Medical Society has elected the following officers for 1933: Dr. Paul R. Wilson, Piedmont, President; Dr. J. B. Groves, Petersburg, Dr. Harry Rollings, Wardensville, Dr. James Dailey, Romney, Dr. James T. Wolverton, Piedmont, Dr. S. B. Johnson, Franklin, Vice-Presidents; and Dr. T. C. Giffin, Keyser, reelected Secretary-Treasurer.

The Hancock County Medical Society has elected the following officers for 1933: Dr. M. H. Powers, President; Dr. J. E. Richmond, Vice-President; and Dr. F. B. Harrington, reelected Secretary-Treasurer; all of Weirton.

The Kanawha County Medical Society has elected the following officers for 1933: Dr. G. G. Irwin, President; Dr. H. L. Robertson, Vice-President; and Dr. M. F. Peterson, reelected Secretary-Treasurer; all of Charleston.

The Lewis County Medical Society has elected the following officers for 1933: Dr. E. R. Cooper, Troy, President; Dr. L. C. Corder, Jane Lew, Vice-President; and Dr. H. M. Andrew, Weston, reelected Secretary-Treasurer.

The Logan County Medical Society has elected the following officers for 1933: Dr. B. D. Smith, Omar, President; Dr. R. W. Roberts, Man, Vice-President; and Dr. Fred E. Brammer, Dehue, Secretary-Treasurer.

The Parkersburg Academy of Medicine has elected the following officers for 1933: Dr. R. H. Wharton, President; Dr. A. M. Dearman, Vice-President; and Dr. John T. Goff, reelected Secretary-Treasurer; all of Parkersburg.

Dr. Robert C. Farrier, Morgantown, is the newly elected President of the West Virginia Public Health Association.

Dr. Tyler R. Boling, formerly of Tazewell County, Virginia, has located at Beckley, where he will be House Physician at the Rutherford State Sanitarium.

DEATHS

Dr. Ulysses Grant Cook, Beckley, aged 68, died November 10 of cerebral hemorrhage.

Dr. John H. Rinehart, Worthington, aged 72, died October 25 of lobar pneumonia.

Dr. Moses Thomas Sinclair, Institute, aged 56, died in October of cerebral hemorrhage.

Dr. George Edwin Lewis, Chester, aged 59, died November 5.

Dr. William B. Gaston, Clarksburg, aged 34, died December 12 of pneumonia.

Dr. Clifford W. Sperow, Martinsburg, aged 57, died suddenly December 8 of angina pectoris.

Dr. E. A. Winter, St. Albans, aged 72, died December 1 from an automobile accident.

Dr. S. K. Owens, Montgomery, aged 66, died December 3.

12 REASONS

why WHITE'S Cod Liver Oil tablets should be used in your Armamentarium

1. **PROVEN**—A background of research in this field extending over five years. One of the first vitamin-stable concentrates accepted for N.N.R.

2. **NATURAL** — Contain natural vitamins A and D as found in cod liver oil.

3. **STABLE** — Guaranteed stable for an unlimited period. Sealed against vitamin loss from oxidation, rancidity, sunlight, etc.

4. **TESTED**—All tests are rigid and adequate.

5. **CLINICS** — Backed by controlled clinical studies in rickets and other conditions accompanied by disturbances of calcium-phosphorus metabolism.

6. **TOLERANCE** — Easily tolerated because of the removal of the natural fats.

7. **POTENT** — Each tablet contains not less than 685 Vitamin A Units (ophthalmic and weight) and not less than 400 Vitamin D Units (A.D.M.A.)

8. **CANDY**—Taste just like candy. Children love them. Even gravidae accept them.

9. **DOSAGE** — A dose is always a dose—a tablet a half teaspoonful.

10. **INFANTS**—Easy to give. Simply crush required number of tablets in day's formula or in orange juice. No anorexia—no oily nipples or bottles.

11. **TOXICITY**— None found or recorded.

12. **ECONOMY** — Low patient cost; certainty of a potent product and continuance of dosage by patients who object to oil.

Compare!

Consider these advantages! Compare them with other vitamin preparations. Prescribe White's Cod Liver Oil Concentrate Tablets wherever you would cod liver oil with equal certainty and better patient acceptance. White's have all the vitamin activity found in cod liver oil without the bulk or disagreeable taste.

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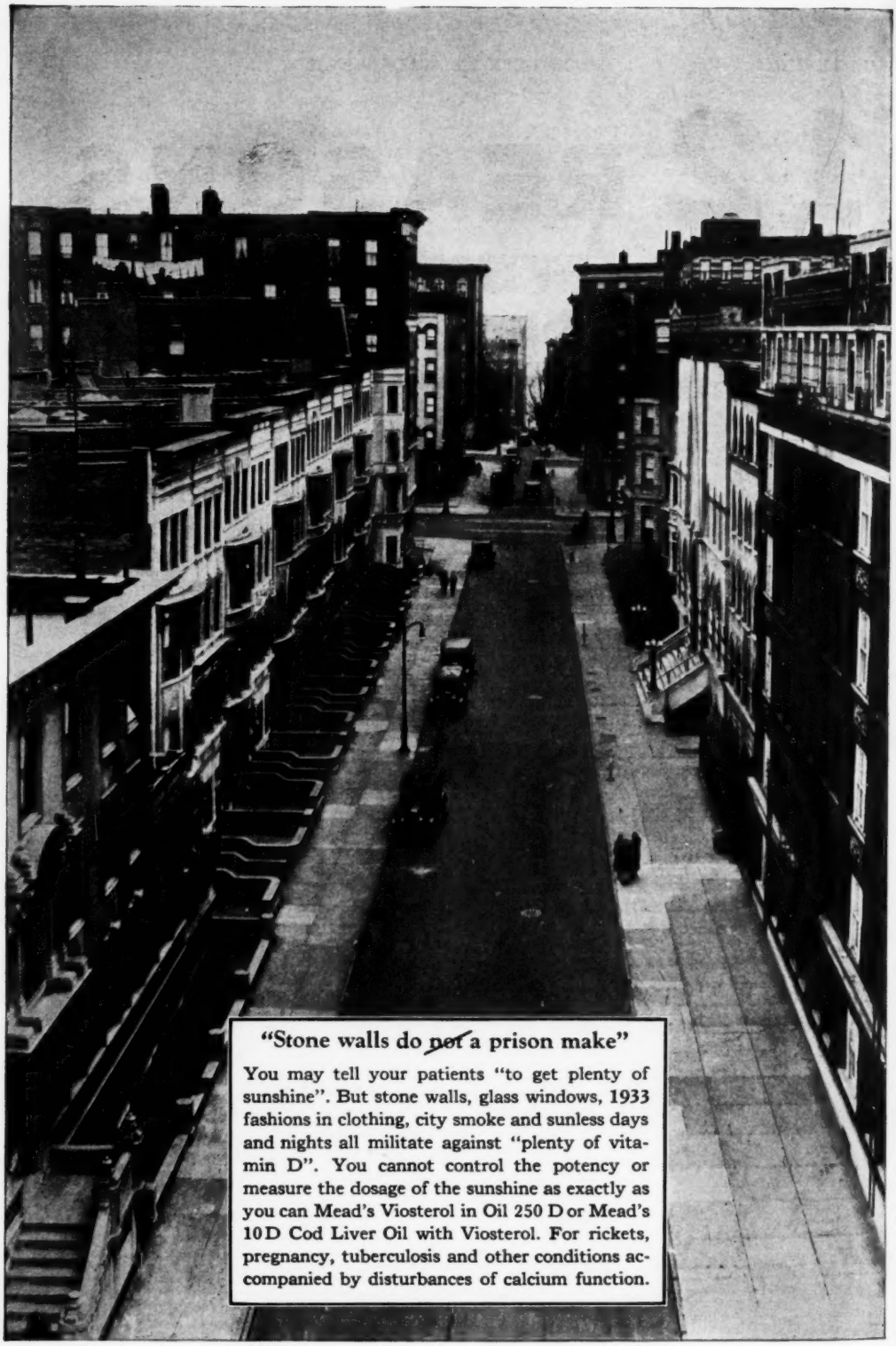


"Stone walls do ~~not~~ a prison make"

You may tell your patients "to get plenty of sunshine". But stone walls, glass windows, 1933 fashions in clothing, city smoke and sunless days and nights all militate against "plenty of vitamin D". You cannot control the potency or measure the dosage of the sunshine as exactly as you can Mead's Viosterol in Oil 250 D or Mead's 10 D Cod Liver Oil with Viosterol. For rickets, pregnancy, tuberculosis and other conditions accompanied by disturbances of calcium function.

There is Greater Margin of Safety in Mead's Dextri-Maltose

The Dextri-Maltose Group

Dextri-Maltose No. 1 (with 2% sodium chloride), for normal babies. Dextri-Maltose No. 2 (plain, salt free), for salt modifications by the physician. Dextri-Maltose No. 3 (with 3% potassium bicarbonate), for constipated babies. "Dextri-Maltose With Vitamin B" is now available for its appetite-and-growth-stimulating properties.

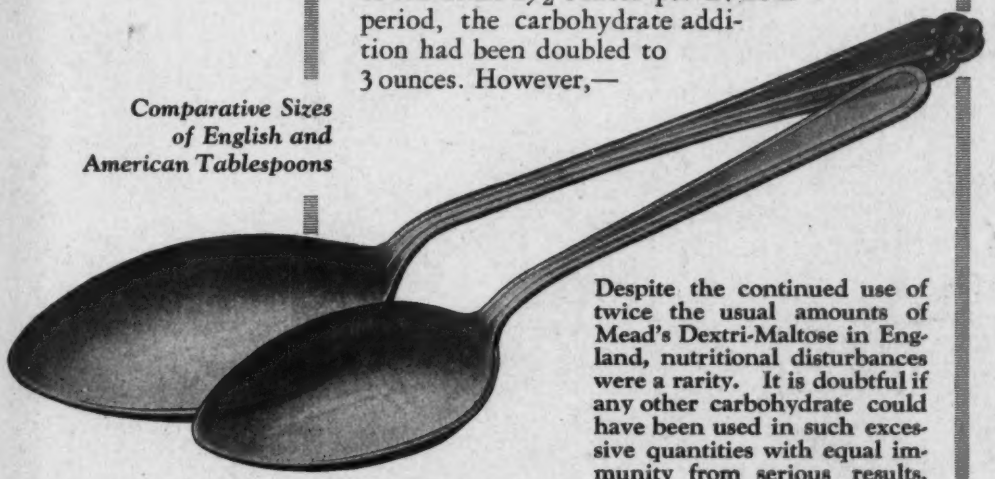
Samples on Request.

NOTHING tells more graphically the story of greater safety—the freedom from nutritional disturbances in infant feeding that goes with the use of Mead's Dextri-Maltose, than the circumstances surrounding its introduction in England.

In England, as in America, it had been prescribed—for modifying cow's milk—by the level tablespoonful.

It was not until Dextri-Maltose had been used in England for over three years, that a prominent English pediatrist pointed out that the British tablespoon is twice the size of the American. The English level tablespoon holds ½ ounce of Dextri-Maltose, the American, ¼ ounce. Where 6 American tablespoons had been prescribed in 24 hours, the infant was actually taking 12, or, in other words, instead of the usual 1½ ounces per 24-hour period, the carbohydrate addition had been doubled to 3 ounces. However,—

Comparative Sizes of English and American Tablespoons



Despite the continued use of twice the usual amounts of Mead's Dextri-Maltose in England, nutritional disturbances were a rarity. It is doubtful if any other carbohydrate could have been used in such excessive quantities with equal immunity from serious results.

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SPECIALISTS IN INFANT DIET MATERIALS

So Rich in Vitamins A and D

that you prescribe Minims instead of Teaspoonfuls

OFFERED to the medical profession but one short year ago, Haliver Oil with Viosterol has materially widened the scope of vitamin therapy by making vitamins A and D agreeably available to all those patients who need these vitamins but who seriously object to cod-liver oil because of its taste and the size of the dose.

For most patients it is an ordeal to have to take a teaspoonful of any fish oil. Parke-Davis Haliver Oil makes it possible to obtain full therapeutic effects by prescribing minims instead of teaspoonfuls. One minim of Haliver Oil with Viosterol-250 D contains as much vitamin A as a teaspoonful of a high grade cod-liver oil containing 500 U. S. P. units per Gram. Its vitamin D potency is the same as that of Viosterol in Oil-250 D.

This striking advance was of course bound to win widespread approval from the medical profession. Physicians everywhere are prescribing the new preparation in conditions which formerly had to be met with cod-liver oil.

These physicians, incidentally, are earning the gratitude of thousands of mothers who in the past have had the none-too-easy task of giving cod-liver oil several times a day to babies or young children. It doesn't take a diplomat or a disciplinarian to carry out the doctor's orders when the entire daily dose is a few drops, given all at one time.

And, of course, all that the adult patient needs to do is to take one or two soft gelatin capsules no larger than a pea!

Parke-Davis Haliver Oil with Viosterol is put up in 5-cc. and 50-cc. amber bottles; and in 3-minim capsules, boxes of 25 and 100. Practically every druggist in the United States and Canada is prepared to fill prescriptions for this product.

May we send you sample box of Capsules with descriptive literature? A postcard will bring it to you by return mail. Address Medical Service Dept., Parke, Davis & Co., Detroit, Michigan.

Specify Parke-Davis Haliver Oil with Viosterol-250 D